

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Dr. S. M. Bargir

Programme - B. Com. I

Semester - I

Subject: Mathematics

Course Title: Business Mathematics-II(3OEC02MAT11)

Month: June-July			Module/Unit: I	Sub-units planned
Lectures	Practical's	Total	Matrix	1.1.Definition of a matrix and its types 1.2.Algebra of matrices. 1.3.Adjoint of matrix 1.4. Finding inverse of matrix by using adjoint matrix. 1.6.Solution of system of linear equations by using Crammer's rule.
16	00	16		
Month : July-August			Module/Unit: III	Sub-units planned
Lectures	Practical's	Total	Linear Programming Problems	2.1Definition 2.2Formulation of given problem in LPP 2.4.Solution by Graphical Method 2.5.Solution by Simplex Method
14	00	14		

(Dr. S. M. Bargir)

Name and Signature of Teacher



(Prof. S.P. 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: 2025-2026

Annual Teaching Plan

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

Programme - B. Com. I

Semester - I

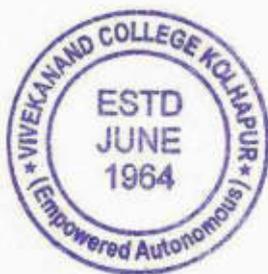
Subject: Mathematics

Course Title: Business Mathematics-II(3OEC02MAT12)

Month: August-September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Introduction of A.P , G.P.,Ratio, Percentage and Interests	1.1 Arithmetic Progression 1.2 Geometric Progression 1.3 Different types of interest rates 1.4 Introduction of ration and percentage 1.5 Concept of proportion 1.6 Application to division into proportional part
17	00	17		
Month : September - October			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Set Theory	2.1 Definition of set 2.2 Types of Set 2.3 Operation on Set 3.4 Relation and types of relations 3.5 Function and Types of Functions and its Venn Diagram 3.6 Domin and range of function
13	00	13		


(Ms. A. D. Patil)

Name and Signature of Teacher





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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. I

Semester - I

Subject: Mathematics

Course Title: Basic Algebra(2DSC03MAT11)

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Algebra of Complex Numbers	1.1 Sum and Products , Moduli, Polar form, Geometrical representation of Complex numbers, Exponential form, arguments of product and Quotients. 1.2 De-Moivre's Theorem and examples
04	00	04		
Month: August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Algebra of Complex Numbers	1.3 Application of De-Moivre's Theorem 1.3.1 nth root of unity 1.3.2 Expansion of $\cos n \theta, \sin n \theta$ 1.3.3 Expansion Circular functions and hyperbolic functions. 1.3.4 Relation between circular and hyperbolic functions. 1.3.5 Inverse circular and hyperbolic functions.
04	00	04		

G.B. Kolhe

(Mr. G. B. Kolhe)

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Mr. M. A. Jadhav

Programme - B. Sc. I

Semester - I

Subject: Mathematics

Course Title: Basic Algebra(2DSC03MAT11)

Month : September			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Matrices	2.1 Introduction 2.2 Definition of Hermitian and Skew Hermitian matrices. 2.3 Properties of Hermitian and Skew Hermitian matrices. 2.4 Rank of Matrix, Row echelon form and reduced row echelon form, normal form
04	00	04		
Month : October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Matrices	2.5 System of linear homogeneous and non-homogenous equations. 2.6 Characteristic equation, eigen value and eigen vectors of a matrix. 2.7 Cayley Hamilton theorem and example
03	00	03		

(Mr. M. A. Jadhav)

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Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. I

Semester - I

Subject: Mathematics

Course Title: Calculus(2DSC03MAT12)

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Differentiation	1.1. Successive Differentiation
04	00	04		1.1.1. Higher order derivatives: notations.
				1.1.2. Leibnitz's Theorem. The n^{th} derivative of product of two functions.
				1.1.3. Examples on Leibnitz's Theorem.
Month: August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Differentiation	1.2. Partial differentiation
04	00	04		1.2.1. Introduction to functions of two and more variables
				1.2.2. Partial derivative: first order and higher order - examples.
				1.2.3. Geometrical interpretation of partial derivatives of first order.

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. I

Semester - I

Subject: Mathematics

Course Title: Calculus(2DSC03MAT12)

Month : September			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Mean Value Theorems and Indeterminate forms	2.1 Mean Value Theorems
03	00	04		2.1.1 Rolle's Mean Value Theorem, Geometrical interpretation. 2.1.2 Lagrange's Mean Value Theorem, Geometrical interpretation. 2.1.3 Meaning of sign of derivative 2.1.4 Cauchy's Mean Value Theorem. 2.1.5 Examples
Month : October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Mean Value Theorems and Indeterminate forms	2.2 Indeterminate forms
02	00	03		2.2.1 Indeterminate forms: L' Hôpital rule 2.2.2 The indeterminate forms $0 \times \infty, \infty - \infty, 0^0, 1^\infty, \infty^0$ 2.3 Expansion of functions 2.3.1 Maclaurin's theorem (statement only): Examples. 2.3.2 Taylor's theorem (statement only): Examples.

(Ms. S. J. Koshti)

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Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. I

Semester - I

Subject: Mathematics

Course Title: Mathematics Lab-I: 2(DSC03MAT19)

Month: July-August			Module/Unit:	Sub-units planned
Lectures	Practical's	Total	Lab 1	1.Examples on De-Moivre's Theorem. 2.Examples on n^{th} roots of unity 3.Expansion on $\cos n\theta, \sin n\theta$ 4.Solution of system of linear homogeneous equations. 5.Solution of system of linear non-homogeneous equations. 6.Eigen values and Eigen vectors of matrix 7.Cayley-Hamilton Theorem (Verification and finding inverse of matrix) 8.Examples of n^{th} derivative
00	08	08		

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Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. I

Semester - I

Subject: Mathematics

Course Title: Mathematics Lab-I: 2(DSC03MAT19)

Month: September-October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Lab 1	9.Examples on Leibnitz's Theorem. 10.Examples on partial differentiation 11.Examples on Lagrange's Mean Value Theorem 12.Examples on Cauchy's Mean Value Theorems. 13.Examples on L' Hospital's rule for $0 \times \infty$ and $\infty - \infty$ form 14.Examples on L' Hospital's rule for 0^0 and $1^\infty, \infty^0$ form 15.Examples on expansion of functions
00	07	07		

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Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Dr. S. M. Bargir

Programme - B. Sc. I

Semester - I

Subject: Mathematics

Course Title: Foundation of Mathematic(2OEC03MTS11)

Month: July-August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Aptitude - 1	1.Venn Diagram and operations on sets 2.Cartesian Product of sets 3.Types of relations 4.Equivalence Relation 5.Equivalence Class
00	08	08		
Month: Feb- September-October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Aptitude - 2	6.Functions and their types 7.Midpoint, Distance, Section formula 8.Standard graphs on GeoGebra in Cartesian Coordinate system 9.Standard graphs on GeoGebra in Polar Coordinate system 10. Absolute Value
00	07	07		

(Dr. S. M. Bargir)

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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
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Annual Teaching Plan

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

Programme - B. Sc. II (Major)

Subject: Mathematics

Semester - III

Course Title: Differential Equations-(DSC03MAT31)

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practical's	Total	Equation of First order	1.1.1 Introduction 1.1.2 Method I: Equations solvable for p 1.1.3 Method II: Equations solvable for x 1.1.4 Method III: Equations solvable for y 1.1.5 Method IV: Equations in Clairaut's form 1.1.6 Method V: Equations reducible to Clairaut's form.
08	00	08		
Month: August			Module/Unit: I	Sub-units planned
Lectures	Practical's	Total	Cauchy-Euler equation	1.2.1. Homogeneous linear equation (Cauchy-Euler equation) 1.2.2. Method of solution of homogeneous linear differential equations 1.2.3. Equations reducible to homogeneous linear form (Legendre's linear equations)
08	00	08		
Month : September			Module/Unit: II	Sub-units planned
Lectures	Practical's	Total	Linear differential equations of second order	2.1.1. The general (standard) form of the linear differential equation of the second order. 2.1.2. Complete solution of $y'' + Py' + Qy = R$ in terms of one known integral belonging to the complementary function (C.F.). 2.1.3. Rules for getting an integral belonging to C.F. of $y'' + Py' + Qy = R$. 2.1.5. Removal of first derivative
07	00	07		
Month : October			Module/Unit: II	Sub-units planned
Lectures	Practical's	Total	Simultaneous differential equations of the form $(dx)/P = (dy)/Q = (dz)/R$	2.2.1. The nature of solution of $(dx)/P = (dy)/Q = (dz)/R$ 2.2.3. Geometrical interpretation of $(dx)/P = (dy)/Q = (dz)/R$ 2.2.4. Rule I for solving $(dx)/P = (dy)/Q = (dz)/R$ 2.2.5. Rule II for solving $(dx)/P = (dy)/Q = (dz)/R$ 2.2.6. Rule III for solving $(dx)/P = (dy)/Q = (dz)/R$ 2.2.7. Rule IV for solving $(dx)/P = (dy)/Q = (dz)/R$
07	00	07		

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(Ms. S. J. Koshti)

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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. II (Major)

Subject: Mathematics

Semester - III

Course Title: Numerical Methods(2DSC03MAT32)

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Solutions of Algebraic and Transcendental Equations	1.1.1 Introduction 1.1.2. Basic properties of equations 1.1.3 Synthetic division of a polynomial by a linear expression 1.1.4 Bisection Method 1.1.5 Method of False Position or Regula-Falsi Method 1.1.6 Newton- Raphson method 1.1.7 Examples based on art.1.1.2 to 1.1.6
08	00	08		
Month: August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Interpolation	1.2.1 Introduction 1.2.2 Finite differences 1.2.3 Shift and inverse shift operator 1.2.4 Relations between above operators 1.2.5 Interpolation with equal intervals 1.2.6 Interpolation with unequal intervals: Lagrange's interpolation formula 1.2.7 Examples based on art.1.2.2 to 1.2.6
08	00	08		
Month : September			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Numerical Integration	2.1.1 Introduction 2.1.2 Newton-Cotes Quadrature Formula 2.1.3 Trapezoidal rule 2.1.4 Simpson's 1/3 rd - rule 2.1.5 Simpson's 3/8 th - rule 2.1.6 Examples based on art. 2.1.3 to 2.1.5.
08	00	08		
Month : October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Numerical Solutions of ODE:	2.2.1 Introduction 2.2.2 Picard's method 2.2.3 Taylor's series method 2.2.4 Euler's method 2.2.5 Modified Euler's method 2.2.6 Runge-Kutta methods 2.2.7 Examples based on art. 2.2.2 to 2.2.6.
06	00	06		

G.B. Kolhe

(Mr. G. B. Kolhe)

Name and Signature of Teacher



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(Prof. S.P. Thorat)

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. II

Subject: Mathematics

Semester - III

Course Title: DSC Practical(2DSC03MAT39)

Month: July-August			Module/Unit: I	Sub-units planned
Lectures	Practical's	Total	Differential Equation II	1. Equations solvable for p, x and y 2. Clairaut's equation & equations reducible to Clairaut's form 3. Homogeneous linear differential equations 4. Legendre's linear equations 5. Solution of linear differential equation of second order when one integral is known 6. Solution of linear differential equation of second order by the change of dependent variable 7. Solution of linear differential equation of second order by the change of independent variable
00	07	07		



(Ms. S. J. Koshti)

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Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

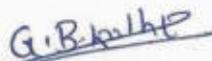
Programme - B. Sc. II

Subject: Mathematics

Semester - III

Course Title: DSC Practical(2DSC03MAT39)

Month: September-october			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Numerical Method	8.Bisection method
00	08	08		9.Newton Raphson method
				10.Newton's forward and backward interpolation formula
				11.Lagrange's interpolation formula
				12.Evaluation of Numerical integration by using Simpson's 1/3 rd rule
				13.Evaluation of Numerical integration by using Simpson's 3/8 th rule
				14.Numerical solutions of ordinary differential equations by Modified Euler's method.
				15.Numerical solutions of ordinary differential equations by Runge-Kutta method of second and fourth order


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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Dr. S. M Bargir

Programme - B. Sc. II

Semester - III

Subject: Mathematics

Course Title: Introduction to programming in Scilab
(2DSC03MAT39)

Month: July-August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Introduction and Basic of Scilab	1. Overview of Scilab and its applications in mathematics. Installing Scilab, 2. Scilab environment, 3. Getting Help in Scilab. 4. Use of Scilab as a calculator. 5. Introduction, Character Set. 6. Data types, Operators.
00	05	05		
Month: August - September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Vectors and Matrices:	1. Introduction to Matrices and Arrays, 2. Row matrix, column matrix, general matrix, empty matrix, 3. Operation on matrix 4. Addition, Subtraction, Product, Element-wise operation, 5. transpose, determinant, inverse, trace, rank, Matrix functions: eye(), zero(), ones()
00	05	05		
Month : September-october			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Polynomial & Eigen Values and Eigen Vectors	1. Polynomial creation, 2. Polynomial evaluation, 3. Roots of a Polynomial, coefficient, degree 4. Polynomial Arithmetic Operations, polynomial division, Polynomial Differentiation and Integration 5. Deflation, GCD , isreal(), ispoly(), 6. Introduction, definition, Calculation companion matrix using characteristic polynomial, diagonalisable matrix.
00	04	04		



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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Mr. M. A. Jadhav

Programme - B. Sc. II

Semester - III

Subject: Mathematics

Course Title: Introduction to Python(2VSC03MAT39)

Month: July-August			Module/Unit:	Sub-units planned
Lectures	Practical's	Total	Introduction to Python	1.Introduction to Python 2. Expressions and Operators 3. Input Output Statements 4. Conditional Statements 5. Looping Statements
00	07	07		
Month: September-October			Module/Unit:	Sub-units planned
Lectures	Practical's	Total	Improper Integrals	6. Functions 7. Modules and Packages 8. Math, cmath, random modules and functions 9. Roots of Equations: Bisection Method, Newton-Raphson Method 10. Initial Value Problem-I: Euler's, Euler's Modified
00	08	08		

(Mr. M. A. Jadhav)

Name and Signature of Teacher



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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Mr. M. A Jadhav

Programme - B. Sc. II

Semester - III

Subject: Mathematics

Course Title: Computational Mathematics for Sciences-I
(2MIN03MAT31)

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Partial differentiation and Jacobians	1.1. Partial differentiation 1.1.1. Revision of Partial derivatives 1.1.2. Partial derivatives of composite Functions 1.1.3. Homogeneous functions: definition 1.1.4. Euler's theorems on homogeneous functions
08	00	08		
Month: August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Partial differentiation and Jacobians	1.2. Jacobian 1.2.1 Definition of Jacobian 1.2.2. Properties of Jacobians. 1.2.3. Jacobian of implicit functions (without proof)
07	00	07		
Month : September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Vector Calculus	2.1.1. The Scalar and Vector valued Point functions 2.1.2. The Operator ∇ 2.1.3. Gradient of a Scalar Point Function: definition 2.1.4. Directional derivatives of scalar and vector point functions 2.1.5. Geometrical Interpretation of $\text{grad } \phi$. 2.1.6. Divergence of vector point function 2.1.7. Curl of vector point function
09	00	09		
Month : October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Vector Calculus	2.1.8. Gradient, Divergence and Curl of sums 2.1.9. Gradient, Divergence and Curl of Products 2.1.10 Second order differential operators 2.1.11. The Laplacian Operators ∇^2 2.1.12. Solenoidal and Irrotational vector fields
06	0	06		



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Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. II

Semester - III

Subject: Mathematics

Course Title: Improper Integrals and Special Functions
(2MIN03MAT32)

Month: Jly			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Improper Integrals	1.1. Introduction 1.2. Improper Integrals of the First Kind (Range of Integration is Infinite) (Definition) 1.3. Improper Integral of the Second Kind Definition 1.4. Gamma Function
08	00	08		
Month: August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Improper Integrals	1.5. Some Identities of Gamma Function 1.6. Beta Function 1.7. Some Identities of Beta function .
07	0	07		
Month: Septeber			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Improper integrals involving a parameter and the Error functions	2.1. Definition of improper integral involving a parameter 2.2. Integral with its limits as constants (Statement only) 2.3. Integral with limits as functions of the parameter (Leibnitz's Rule) (Statement only) 2.4. Error Function Integral $\text{erf}(x)$
08	00	08		
Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Improper integrals involving a parameter and the Error functions	2.6. Complementary Error Function Integral $\text{erf}_c(x)$ 2.7. Expression for $\text{erf}(x)$ in series 2.8. Properties of error-integral functions 2.9. Examples on 2.5 to 2.7
07	00	07		

S.P. Thorat

(Dr. S. P. Thorat)

Name and Signature of Teacher



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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2025-2026
Annual Teaching Plan

Name of the teacher: Dr. S. M Bargir

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

Course Title: MIN Practical - III(2MIN03MAT39)

Month: September-October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Interpolation on Evenly Spaced Points	1. Gamma function 2. Properties of gamma function 3. Beta function 4. Properties of beta function 5. Identities of Beta function 6. Differentiation under integral sign for finite Limit 7. Differentiation under integral sign for infinite limit 8. Error Function
08	0	08		



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Annual Teaching Plan

Name of the teacher: Mr. M. A. Jadhav

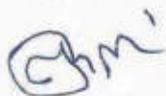
Programme - B. Sc. II

Semester - IV

Subject: Mathematics

Course Title: MIN Practical - III(2MIN03MAT39)

Month: July-August			Module/Unit:	Sub-units planned
Lectures	Practical's	Total	Interpolation on Evenly Spaced Points	1. Euler's theorems on homogeneous functions 2. Jacobians 3. Curl, 4. Divergence 5. Gradient 6. Solenoidal and Irrotational vector field 7. Directional Derivatives
07	00	07		



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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. II

Semester - III

Subject: Mathematics

Course Title: Quantitative Analysis (2OEC03MTS31)

Month: July-August			Module/Unit:	Sub-units planned
Lectures	Practical's	Total	Aptitude - 1	1.Number system 2. Simplification 3. Square root and cube roots 4.Calendar 5. Clocks
07	00	07		
Month: September-October			Module/Unit:	Sub-units planned
Lectures	Practical's	Total	Aptitude - 2	6. Boat and Streams 7. Allegation or Mixture 8. Probability 9. Simple Interest 10. Compound Interest
08	00	08		



(Ms. A. D. Patil)

Name and Signature of Teacher



(Prof. S.P. 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: 2025-2026

Annual Teaching Plan,

Name of the teacher: Dr. S. M. Bargir

Programme - B. Sc. III

Subject: Mathematics

Semester - V

Course Title: Real Analysis (DSC03MAT51)

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Sequence of real numbers	1. Upper bound, Lower bound, 2. Least upper bound, Greatest lower bound, 3. Definition of sequence and subsequence, 4. Limit of a sequence, Convergent sequence, Divergent sequence, 5. Bounded sequence, Monotone sequence, 6. Limit superior and limit inferior, 7. Cauchy sequences.
08	00	08		
Month: August			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Series of Real Numbers	1. Convergence and Divergence, 2. Series with non-negative terms, Alternating series, 3. Conditional convergence and absolute convergence, 4. Rearrangements of series, Tests of absolute convergence, 5. Series whose terms form a nonincreasing sequence.
08	00	08		
Month: September			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Riemann Integral	1. Riemann integrability and integral of a bounded function over finite domain, 2. Darboux's theorem, definition of integrability and integral, 3. Conditions for integrability, 4. Particular classes of bounded integrable function 5. Properties of integrable functions.
07	00	07		
Month: October			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Improper Integrals	1. Definitions of Improper integral, Test for convergence at 'a'. Positive integrand $f(x)$, not necessarily positive. 2. General test for convergence, Convergence at ∞ , the integrand being not necessarily positive: General test for convergence, Absolute convergence, Tests for conditional convergence.
07	00	07		


(Dr. S. M. Bargir)

Name and Signature of Teacher





(Prof. S. P. Thorat)

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DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Mr. M. A. Jadhav

Programme - B. Sc. III

Semester - VI

Subject: Mathematics

Course Title: Abstract Algebra (DSC03MAT52)

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Groups	1.Binary Compositions, 2.Permutations, Cyclic Permutations, Cycles of a Permutation, Disjoint Permutations Even permutation, odd permutation, 3.Groups - Abelian groups (definition and examples), Subgroups, Centre of group, 4. Normaliser of subgroup, Cosets, Cyclic Groups, Euler's theorem and Fermat's theorem
08	00	08		
Month: August			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Normal Subgroup ,Homomorphism	5.Normal Subgroups, Quotient Groups, 6.Homomorphisms, Isomorphisms, Kernel, Fundamental theorems of homomorphism, conjugate elements
07	00	07		
Month: September			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Rings	7.Rings, zero divisors, Integral domains, Field, 8.Subrings, Characteristic of a Ring, Idempotent element, nilpotent element, Product of Rings, 9.Ideals, Sum of Ideals, Product of Ideals, Simple rings
08	00	08		
Month: October			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Homomorphism Rings	10.Quotient Rings, Homomorphisms, kernel, fundamental theorems of ring homomorphism, Embedding of Rings(statements), Maximal Ideal, Prime ideals.
07	00	07		

(Mr.M.A.Jadhav)

Name and Signature of Teacher



(Prof. S.P. Thorat)

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. III

Subject: Mathematics

Semester - VI

Course Title: Partial Differential Equation(DSC03MAT53)

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practical's	Total	Linear Partial Differential equation of order one	1. Definition, Order of a P.D.E., Degree of a P.D.E., Linear and non-linear P.D.E., Notations, Classification of first order P.D.E., Origin of P.D.E., 2. Derivation of P.D.E., by the elimination of arbitrary constants, examples, Derivation of P.D.E., 3. by elimination of arbitrary functions. examples, 4. Cauchy's problem for first order equations, Lagrange's method of solving $Pp + Qq = R$,
07	00	07		
Month: August			Module/Unit: II	Sub-units planned
Lectures	Practical's	Total	Non-Linear Partial Differential equation of order one	5. Complete integral, particular integral, singular integral and general integral, 6. Geometrical interpretation of integrals of $f(x, y, z, p, q) = 0$, Method of getting singular integral directly from the P.D.E. of first order, 7. Charpit's method and its particular form.
08	00	08		
Month: September			Module/Unit: III	Sub-units planned
Lectures	Practical's	Total	Homogeneous linear partial differential equation with constant coefficients.	8. Homogeneous and non-homogeneous linear P.D.E. with constant coefficients, Solution of a homogeneous linear P.D.E. with constant, Method of finding the complementary function (C.F.) of linear homogeneous coefficients, 9. P.D.E. with constant coefficients Working rule for finding C.F. of linear P.D.E. with constant coefficients, Alternative working rule for finding C.F. examples, 10. Particular integral (P.I.) of homogeneous P.D.E., Short methods of finding P.I.
08	00	08		
Month: October			Module/Unit: IV	Sub-units planned
Lectures	Practical's	Total	NonHomogeneous linear partial differential equation with constant coefficients.	11. Convergence of sequences and series (theorem without proof). 12. Taylor's series (without proof), 13. Laurent's series (without proof), 14. Isolated singular points, residues. 15. Zeros of analytic functions, zero and poles.
07	00	07		

S.P. Thorat

(Prof. S. P. Thorat)

Name and Signature of Teacher



S.P. Thorat

(Prof. S.P. Thorat)

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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: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. III (Major)

Subject: Mathematics

Semester - V

Course Title: Numerical Methods (DSE03MAT52)

Month: July			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), Newton's divided difference form of interpolating polynomial, examples
07	00	07		
Month: August			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Numerical Interpolation for equal interval)	3.Forward interpolation: Newton's forward differences, forward difference table. Newton's forward form of interpolating polynomial (formula only), examples. 4.Backward interpolation: Newton's backward differences, backward difference table, Newton's backward form of interpolating polynomial (formula only), examples
08	00	08		
Month: September			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Numerical Differentiation and Integration	5.Numerical differentiation based on interpolation polynomial. 6.Numerical integration: Newton-Cotes formula, Basic Trapezoidal rule (excluding the computation of error term), composite Trapezoidal rule, examples, Basic Simpson's 1/3rd rule (excluding the computation of error term), composite Simpson's 1/3rd rule, examples, Basic Simpson's 3/8th rule (excluding the computation of error term), composite Simpson's 3/8th rule, examples.
08	00	08		
Month: October			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Solution of First order Ordinary differential equation	7.Euler's Methods, Modified Euler's Methods, Examples, Second order Runge Kutta method (formula only), examples, Fourth order Runge-Kutta method (formula only), examples
08	00	07		

G.B. Kolhe

(Mr. G. B. Kolhe)

Name and Signature of Teacher



S.P. Thorat

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. III (Minor)

Subject: Mathematics

Semester - V

Course Title: Computational Mathematics (MIN03MAT51)

Month: July			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), Newton's divided difference form of interpolating polynomial, examples
07	00	07		
Month: August			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Numerical Interpolation for equal interval)	3.Forward interpolation: Newton's forward differences, forward difference table. Newton's forward form of interpolating polynomial (formula only), examples. 4.Backward interpolation: Newton's backward differences, backward difference table, Newton's backward form of interpolating polynomial (formula only), examples
08	00	08		
Month: September			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Numerical Differentiation and Integration	5.Numerical differentiation based on interpolation polynomial. 6.Numerical integration: Newton-Cotes formula, Basic Trapezoidal rule (excluding the computation of error term), composite Trapezoidal rule, examples, Basic Simpson's 1/3rd rule (excluding the computation of error term), composite Simpson's 1/3rd rule, examples, Basic Simpson's 3/8th rule (excluding the computation of error term), composite Simpson's 3/8th rule, examples.
08	00	08		
Month: October			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Solution of First order Ordinary differential equation	7.Euler's Methods, Modified Euler's Methods, Examples, Second order Runge Kutta method (formula only), examples, Fourth order Runge-Kutta method (formula only), examples
08	00	07		

G. B. Kolhe

(Mr. G. B. Kolhe)

Name and Signature of Teacher



S.P. Thorat

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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Dr. S. M. Bargir

Programme - B. Sc. III(Major)

Semester - V

Subject: Mathematics

Course Title: DSC Mathematics Lab(DSC03MAT59)

Month: July-August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Real Analysis	
07	00	07		1. Least upper bound, Greatest lower bound and Limit of a sequence. 2. Limsup, liminf of a sequence. 3. Finding limit of Cauchy sequences and Alternating series. 4. Convergence, Divergence of series. 5. Conditional Convergence and Absolute convergence of series. 6. Finding Darboux's sum of Function. 7. Finding Riemann Integral of a function. 8. Improper integral of First and Second Kind. 9. Improper integral of Third Kind. 10. Comparison tests.

(Dr. S. M. Bargir)

Name and Signature of Teacher



(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Mr. M. A. Jadhav

Programme - B. Sc. III(Major)

Semester - V

Subject: Mathematics

Course Title: DSC Mathematics Lab(DSC03MAT59)

Month: September-October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Modern Algebra	1. Groups and Abelian Groups 2. Generators of Cyclic groups 3. Finding order of Permutation and composition of two or more Permutation. 4. Center of Group, Normaliser of Subgroup 5. Cosets of group. 6. Finding zero divisors, Characteristics, Idempotent and Nilpotent element of Ring. 7. Finding Range and Kernels of Homomorphism in Groups and rings. 8. Forming Quotient groups, Quotient rings. 9. Ideals of Rings. 10. Finding Maximal and Prime ideals of rings
08	00	08		

(Mr. M. A. Jadhav)

Name and Signature of Teacher



(Prof. S.P. Thorat)

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. III (Major)

Semester - V

Subject: Mathematics

Course Title: DSC Mathematics Lab(DSC03MAT59)

Month: July-August			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Partial Differential Equation	
08	00	08		<ol style="list-style-type: none">1. Eliminating arbitrary constants and function.2. Cauchy's problem for first order equation.3. Lagrange's method for solving PDE.4. Charpit's Method.5. Standard form I (only p and q present) and Standard form II (Clairaut's Equation).6. Standard form III (only p, q and z present) and Standard form IV ($f(x, p) = g(y, q)$).7. Solving Homogeneous linear PDE with constant coefficients when $f(x,y)$ is of the form $eax+by$.8. Solving Homogeneous linear PDE with constant coefficients when $f(x,y)$ is of the form $\sin(ax+by)$ or $\cos(ax+by)$.9. Solving Homogeneous linear PDE with constant coefficients when $f(x,y)$ is of the form $xmyn$.10. Reducible and Irreducible linear PDE with constant coefficients.

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(Dr.S.P.Thorat)

Name and Signature of Teacher



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(Prof. S.P. Thorat)

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. III(Major)

Semester - V

Subject: Mathematics

Course Title: DSC Mathematics Lab(DSC03MAT59)

Month: September-October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Numerical Methods	1. Newton's forward interpolation and Newton's backward interpolation 2. Lagrange's interpolation 3. Newton's Divided difference interpolation 4. Newton's forward differentiation for Tabular Value 5. Newton's backward differentiation for Tabular Value 6. Trapezoidal rule 7. Simpson's 1/3rd rule 8. Simpson's 3/8th rule 9. Euler's Method and Euler's Modified Method 10. Second order Runge-Kutta method and Fourth order Runge-Kutta method
07	00	07		

G. B. Kolhe

(Mr. G. B. Kolhe)

Name and Signature of Teacher



S.P. Thorat

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. III

Semester - V

Subject: Mathematics

Course Title: MIN Mathematics Lab-5

(MIN03MAT59)

Month : July-August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Practicle	1. Newton's forward interpolation and Newton's backward interpolation 2. Lagrange's interpolation 3. Newton's Divided difference interpolation 4. Newton's forward differentiation for Tabular Value 5. Newton's backward differentiation for Tabular Value
00	07	07		
Month : August-September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Practicle	6. Trapezoidal rule 7. Simpson's 1/3rd rule 8. Simpson's 3/8th rule 9. Euler's Method and Euler's Modified Method 10. Second order Runge-Kutta method and Fourth order Runge-Kutta method
00	08	08		

G. B. Kolhe

(Mr. G. B. Kolhe)

Name and Signature of Teacher



S.P. Thorat

(Prof. S.P. Thorat)

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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: 2025-2026

Annual Teaching Plan

Name of the teacher: Dr. S. M. Bargir

Programme - B. Sc. III

Subject: Mathematics

Semester - VI

Course Title: Introduction to Scilab

(VSC-PR-IV : VSC03MAT59)

Month : July-August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Basic Elements of Scilab as a Programming Language	1.Introduction to Scilab 2. Basics of Scilab 3. Polynomial 4. Basic Elements of Scilab as a Programming Language: Scilab Editor, Scilab Keywords, Predefined Variables, Input and Output Statements, Assignment statements, Simple Programs based on elementary operators. 5. Conditional structure:if-else, if-elseif-else, select-case, Simple Programs based on conditional structure.
00	07	07		
Month : August-September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Basic Elements of Scilab as a Programming Language	6.Looping structure: for loop, while loop, break and continue statement 7. Vectors and Matrices: Row matrix, column matrix, general matrix, operation on matrix addition, subtraction, product. 8. Advanced matrix operations: Matrix functions: eye(), zero(), ones() 9. empty matrix, element-wise operation, determinant, inverse, trace of matrix & eigen values and vectors of matrix. 10. Functions: Defining custom functions and Programs based on it. 11. Plotting graph: Creating two dimensional graphs of simple functions.
00	08	08		

(Dr. S.M. Bargir)

Name and Signature of Teacher



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DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Mr. M. A. Jadhav

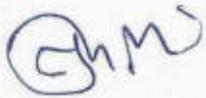
Programme - B. Sc. I

Semester - II

Subject: Mathematics

Course Title: Mathematical Science-II(2OEC03MTS21)

Month: December-January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Aptitude - 1	1.HCF and LCM 2.Logarithm 3.Average and Percentage 4.Profit and Loss 5.Ratio and Proportion
00	04	04		
Month: Feb- March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Aptitude - 2	6.Partnership 7.Pipe and Cistern 8.Time and Work 9.Examples on Time and Distance 10.Examples on trains
00	04	04		



(Mr. M. A. Jadhav)

Name and Signature of Teacher



(Prof. S.P. Thorat)

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Dr. S. M. Bargir

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	2.1 Definitions, Graph, Types of edges. 2.2 Types of graphs, degree of a vertex. 2.3 Undirected and directed graph/digraph. 2.4 Indegree and outdegree of vertex. 2.5 Handshaking lemma. 3.6 Examples on handshaking lemma.
05	00	05		
Month: January			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Graph theory	2.6 Special types of graph(complete graph, Regular graph Biparte and complete bipartite graph). 2.7 Isomorphism 2.8 Adjacency and Incidence matrix of graph Problem based on points
04	00	04		
Month : February			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Operations on Graph	2.9 Subgraphs, vertex deletion, edge addition. 2.10 Complement of a graph and self-complementary graph.
04	00	04		
Month : March			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Operations on Graph	2.11 Union, Intersection and product of graphs. Problem based on all operations on graph .
02	00	02		

(Dr. S. M. Bargir)

Name and Signature of Teacher

(Prof. S. P. Thorat)

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. I

Semester - II

Subject: Mathematics

Course Title: Discrete Mathematics(2DSC03MAT22)

Month: December			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Propositional Calculus	1.1 Revision Propositional logic, Propositional equivalence. 1.2 Predicates Predicate, n-place predicts, n-ary predicts
04	00	04		
Month: January			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Propositional Calculus	1.3 Quantifiers Quantification and quantifiers, universal quantifier, existential quantifier, Quantifier with restricted domains. Logical equivalence involving quantifiers.
05	00	05		
Month : February			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Rules of inference	1.4 Rules of inference Arguments in propositional logic Validity arguments, Numerical problems
04	00	04		
Month : March			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Paths and circuits.	1.5 Rules of inference Rules of inference for propositional logic Building Arguments Numerical problems
02	00	02		

G. B. Kolhe

(Mr. G. B. Kolhe)

Name and Signature of Teacher

S.P. Thorat

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. I

Semester - II

Subject: Mathematics

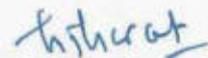
Course Title: Differential Equations - I (2DSC03MAT21)

Month: December			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Ordinary differential equations of first order and first degree:	1.1.Introduction. 1.2.Exact differential equations. Necessary and sufficient condition for exactness. 1.3 Differential equations reducible to exact, integrating factors with rules. 1.4Linear differential equations.
09	00	09		
Month: January			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Ordinary differential equations of first order and first degree:	1.5Differential equations reducible to linear. 1.6 Applications of differential equations of first order and first degree: Examples based on 1.1 to 1.5.
09	00	09		
Month: February			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Linear differential equation with constant coefficient	2.1Introduction. 2.2.Auxiliary equation, Complementary function. 2.3.Types of complementary functions: Distinct real roots, repeated real roots, complex roots, repeated complex roots
08	00	08		
Month: March			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Linear differential equation with constant coefficient	2.4.Particular integrals: Particular integrals of the functions: e^{ax} , $\sin ax$, $\cos ax$, x^m , $e^{ax} \cdot V$ and $x \cdot V$. 2.5.Applications to Electrical circuits. 2.6.Examples based on 2.1 to 2.5.
04	00	04		



(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: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. I

Semester - II

Subject: Mathematics

Course Title: DSC-PR-II(2DSC03MAT29)

Month :			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Differential equations	1) Differential equations reducible to exact 2) Linear differential equations 3) Bernoulli's Differential equations 4) Law of growth 5) Law of decay 6) Newton's law of cooling 7) Orthogonal trajectories to cartesian curve 8) Orthogonal trajectories to polar curve 9) Linear differential equations with constant coefficients 10) Particular integrals of the functions: $e^x, \sin ax, \cos ax$. 11) Particular integrals of the functions: e^x, x^m and x^V .
00	04	04		



(Ms. S. J. Koshti)

Name and Signature of Teacher



(Prof. S.P. Thorat)

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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: 2025-2026

Annual Teaching Plan

Name of the teacher: Ms. R.R. Sawant

Programme - B. Com. I

Semester - II

Subject: Mathematics

Course Title: Business Mathematics-II(3OEC02MAT21)

Month: December			Module/Unit: II	Sub-units planned
Lectures	Practical's	Total	Differentiability and its Applications	1.1 Definition, Methods of differentiation of two functions. 1.2 Second order derivative. 1.3 Maxima and minima. 1.4 Cost, Average cost and marginal cost. 1.5 Revenue and marginal revenue. 1.6 Elasticity of demand.
17	00	17		
Month : January			Module/Unit: III	Sub-units planned
Lectures	Practical's	Total	Integration:	2.1 Integration- An Anti-derivative process. 2.2 Standard forms. 2.3 Method integration by substitution and by parts. 2.4 Definite integral and their properties.
13	00	13		

(Ms. R. R. Sawant)

Name and Signature of Teacher

(Prof. S.P. Thorat)

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VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Ms. R.R. Sawant

Programme - B. Com. I

Semester - II

Subject: Mathematics

Course Title: Business Mathematics-II(3OEC02MAT22)

Month: February			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 : March			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Transportation and Assignment problems:	2.1 Reduced matrix method with examples. 2.2 Maximization in Assignment problem. 2.3 Unbalanced assignment problem. 2.4 North-west corner rule.
15	00	15		

(Ms. R. R. Sawant)

Name and Signature of Teacher

(Prof. S.P. Thorat)

DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. II (Major)

Subject: Mathematics

Semester - IV

Course Title: Integral Calculus (2DSC03MAT42)

Month: December			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Gamma function	1.1.1 Definition of Gamma function and examples. 1.1.2 Properties of Gamma function. 1.1.3 Examples based on article 1.1.2.
05	00	05		
Month: January			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Beta function	1.2.1 Definition of Beta function and examples. 1.2.2 Properties of Beta function. 1.2.3 Relation between Beta and Gamma function 1.2.4 Duplication formula of Gamma function. 1.2.5 Examples based on 1.2.2
09	00	09		
Month : February			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Differentiation under integral sign	2.1.1 Leibnitz first rule of differentiation under integral sign. 2.1.2 Leibnitz second rule of differentiation under integral sign. 2.1.3 Examples based on articles 2.1.1 and 2.1.2.
09	00	09		
Month : March			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Multiple Integrals	2.2.1 Double Integral: Evaluation of double integrals. 2.2.2 Evaluation of double integrals in Cartesian form. 2.2.3 Evaluation of double integrals in Polar form. 2.2.4 Evaluation of double integrals in Cartesian form over the given region. 2.2.5 Evaluation of double integrals in Cartesian form by changing order of integration. 2.2.6 Evaluation of double integrals from Cartesian form to Polar form. 2.2.7 Triple integrals: Evaluation of triple integrals.
07	00	07		

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(Dr. S. P. Thorat)

Name and Signature of Teacher

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(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: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. II (Major)

Subject: Mathematics

Semester - IV

Course Title: Differential Calculus(2DSC03MAT41)

Month: December			Module/Unit: I	Sub-units planned
Lectures	Practical's	Total	Limit, Continuity	1.1 Left hand and Right hand limits (do not use ϵ - δ definition). 1.2 Properties of limits 1.3 Evaluation of limit: Examples (using techniques like factorization, rationalization, Left hand and Right hand limits). 1.4 Continuous functions: definition of Continuity at a point, definition of continuity in an interval. 1.5 Properties of continuous functions. 1.6 Discontinuous functions: Definition, Types of discontinuities - (i) removable discontinuity (ii) discontinuity of first kind (iii) discontinuity of second kind.
05	00	05		
Month: January			Module/Unit: I	Sub-units planned
Lectures	Practical's	Total	Differentiability	1.7 Differentiability at a point and Differentiability in an interval: definitions. 1.10.(Differentiability and continuity) Theorem: A function which is derivable at a point is necessarily continuous at that point.
10	00	10		
Month : February			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Partial derivatives,	2.1 Total Differentials. 2.2 Differentiation of composite functions. 2.3 Homogeneous functions: definition. Euler's theorems on homogeneous functions (Case of two and three variables).
09	00	09		
Month : March			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Jacobian and Extreme values	2.4 Definition of Jacobian and examples. 2.5 Jacobian of function of functions (proof of the corollary $J \cdot J' = 1$ is expected). 2.6 Jacobian of implicit functions (without proof) 2.7 Extreme values 2.8 Maxima and minima of functions of two variables: Sign of quadratic expression, Lagrange's condition for stationary value. 2.9 Lagrange's method of undetermined multipliers for three variables.
06	00	06		



(Ms. S. J. Koshti)

Name and Signature of Teacher



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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

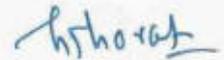
Course Title: DSC Practical(2DSC03MAT49)

Month : December to March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Integral Calculus	1.Gamma function I 2.Gamma Function II 3.Beeta function I 4.Betta Function II 5.Differentiations under integral sign-I 6.Differentiations under integral sign II 7.Evaluation of double integrals by changing order of integration 8.Evaluation of triple integrals
00	04	04		



(Dr. S. P. Thorat)

Name and Signature of Teacher



(Prof. S. P. Thorat)

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DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Mr. M. A. Jadhav

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

Course Title: Computational Mathematics for Sciences-II(2MIN03MAT41)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Interpolation on Evenly Spaced Points	1.1 Introduction: Interpolation, Extrapolation, Interpolating polynomial. 1.2 Finite Differences: Forward Differences (Δ), Backward Differences (∇), Central Differences (δ). 1.3 Shift Operator (E) and means operator (μ).
07	00	07		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Interpolation on Evenly Spaced Points	1.4 Symbolic Relations and Separation of Symbols. 1.5 Forward and Backward Differences of a polynomial. 1.6 Newton's Forward and backward Formulae for Interpolation. 1.7 Examples based on 1.1 to 1.6
08	0	08		

(Mr. M. A. Jadhav)

Name and Signature of Teacher

(Prof. S.P. Thorat)

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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: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

Course Title: Laplace Transform(2MIN03MAT42)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Laplace transform.	1.1 Definitions: Piecewise or Sectional Continuity, Function of Exponential Order, Function of Class 'A'. 1.2 The Transform Concept, Definition of Laplace Transform, Notation. 1.3 Existence of Laplace Transform (Statement only). 1.4 Linear Property, First Shifting Theorem, Second Shifting Theorem and Change of Scale Property.
05	00	05		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Laplace transform.	1.5. Some Standard Results 1.6 Laplace transform of derivatives, Laplace transform of integrals. 1.7 Multiplication by powers of 't', Division by 't'. 1.8 Periodic functions. 1.9 Examples based on 1.1 to 1.8
10	0	10		
Month: February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Inverse Laplace Transform	2.1 Definitions of Inverse Laplace Transform and Null function. Uniqueness Theorem. 2.2 Linear property 2.3 First shifting theorem, second shifting theorem, Unit step function, change of scale property. 2.4 Inverse Laplace transform of derivatives, Division by 's',
09	00	09		
Month: March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Inverse Laplace Transform	2.5 The Convolution theorem, Multiplication by 's'. 2.6 Inverse Laplace by partial fractions, Heaviside's Expansion formula. 2.7 Application to solve Ordinary Linear Differential Equations with constant and Variable Coefficients 2.8 Examples based on 2.1 to 2.7
06	00	06		

G. B. Kolhe

(Mr. G. B. Kolhe)

Name and Signature of Teacher

H. 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: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

Course Title: DSC - IV B(2DSC03MAT49)

Month : December -February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Laplace Transform	8.Laplace transform of derivatives and integrals, 9.Multiplication by powers of 't' and Division by 't'. 10.Laplace transform of Periodic functions 11. Inverse Laplace by partial fractions, 12.Application to Linear Differential Equations.
00	04	04		

G.B. Kolhe

(Mr. G.B. Kolhe)

Name and Signature of Teacher

S.P. Thorat

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

Course Title: DSC Practical(2DSC03MAT49)

Month : December to March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Differential Calculus	1.Evaluation of limit, 2.Continuity 3.Euler's theorems on homogeneous functions 4.Jacobian I 5.Jacobian (Composite rule) 6.Extreme, value of function of two variables 7.Lagrange's method of undetermined Multipliers
00	03	03		

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(Ms. S. J. Koshti)

Name and Signature of Teacher

h Thorat

(Prof. S.P. Thorat)

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

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Ms. R. R. Sawant

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

Course Title: Computational Mathematics for Sciences-II(2MIN03MAT41)

Month: February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Interpolation on Unevenly Spaced Points	2.1 Lagrange's Interpolation Formula. 2.2 Divided Difference and Their Properties.
07	00	07		
Month: March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Interpolation on Unevenly Spaced Points	2.3 Newton's General Interpolation Formula. 2.4 Method of successive approximations 2.5 Examples based on 2.1 to 2.4
08	00	08		

(Ms. R. R. Sawant)

Name and Signature of Teacher

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Mr. M. A. Jadhav

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

Course Title: DSC - IV B(2DSC03MAT49)

Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Computational Mathematics for Sciences-II	1.Finite Differences: Forward Differences (Δ), 2.Backward Differences (∇), 3.Newton's Forward differences formulae 4.Newton's Backward Differences Formulae, 5.Lagrange's Interpolation Formula 6.Newton's General Interpolation Formula. 7.Method of successive approximations.
00	04	04		

(Mr. M. A. Jadhav)

Name and Signature of Teacher

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Mr. M. A Jadhav

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

Course Title: Core course practical in Mathematics

(CCPM-VI)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Python data structures	1. File handling, 2. Python data structures-I,(string, list and tuples and operations) 3. Python data structures-II(Dictionary, sets and their operations),
00	02	02		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Solving algebraic equation	4. Python data structures-III (Arrays and their operations) 5. System of linear algebraic equation: 6. Guassian elimination,LU-Decomposition
00	04	04		
Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Intial value problem	7. Intial value problem-II: RK-2, RK-4
00	03	03		
Month : March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Data visualisation in Python	8. Magic squire, 9. Collatz Conjecture, 10. Graph theory: Network 11. Data visualisation in Python
00	02	02		

(Mr. M. A. Jadhav)

Name and Signature of Teacher

(Prof. S.P. Thorat)

HEAD

DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Dr. S. M. Bargir

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

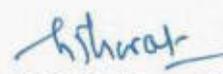
Course Title: DSC - IV B(2DSC03MAT49)

Month : December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Basic Elements of Scilab as a Programming Language	1.Basic elements of Scilab as a Programming Language Conditional structure: if-else conditional structure.
00	02	02		
Month : January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Basic Elements of Scilab as a Programming Language	2.Looping structure: for loop, while loop,... Functions: Defining custom functions and Programs based on it.
00	04	04		
Month :February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Recursive Functions and Plotting graph	3.Recursive Functions: Defining Recursive functions and Programs based on it. Plotting graph: Creating two dimensional graphs of simple functions
00	03	03		
Month : March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Recursive Functions and Plotting graph	4.Euler's, Euler's Modified, Runge-Kutta 2nd Order and 4th Order 5.Trapezoidal, Simpson's 1/3rd And 3/8th, Weddles
00	02	02		



(Dr. S. M. Bargir)

Name and Signature of Teacher


 (Prof. S.P. Thorat)
HEAD
 DEPARTMENT OF MATHEMATICS
 VIVEKANAND COLLEGE, KOLHAPUR
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Mrs. R. R. Sawant

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

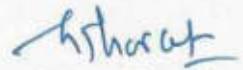
Course Title: OE- MTS-PR (2OEC03MTS41)

Month : December -February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total		
00	12	12		1.Ages 2.Surds and Indices 3. Height and distance 4.Blood Relationship 5.Arithmetic progression 6.Geometric progression 7.Area 8.Volume and surface area 9.Odd man out and series 10.Permutation and combinations.



(Mrs. R. R. Sawant)

Name and Signature of Teacher



(Prof. S.P. Thorat)
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. III

Semester - VI

Subject: Mathematics

Course Title: Complex analysis (DSE-1003F3)

Month: November			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Analytic function.	1.1 Functions of a complex variables, 1.2 limit. 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.
05	00	05		
Month: December			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Elementary functions.	2.1 The exponential function, logarithmic function. 2.2 Some identities involving logarithms. 2.3 Complex exponents, 2.4 trigonometric functions.
09	00	09		
Month: January			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Integrals.	3.1 Derivatives of functions, 3.2 definite integral of functions. 3.3 Contours, contours integral, examples. 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).
09	00	09		
Month: February			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Series.	4.1 Convergence of sequences and series (theorem without proof). 4.2 Taylor's series (without proof), 4.3 Laurent's series (without proof), 4.4 Isolated singular points, residues. 4.5 Zeros of analytic functions, zero and poles.
07	00	07		

S.P. Thorat

(Prof. S. P. Thorat)

Name and Signature of Teacher

S.P. Thorat

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

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2026-2026

Annual Teaching Plan

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

Programme - B. Sc. III(Major)

Semester - VI

Subject: Mathematics

Course Title: Optimization Techniques (DSE03MAT62)

Month: November			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Linear Programming Problem	1.1 Revision of L.P.P., canonical form, standard form of L.P.P. 1.2 Solution of L.P.P by Simplex method and examples, 1.3 Solution of L.P.P by Big - M method and examples.
08	00	08		
Month: December			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Transportation Problem	2.1 Basics of Transportation problem, 2.2 Basic Definitions, Initial Solution: North - West corner method and examples, 2.3 Matrix minima method and examples, 2.4 Vogel's approximation method and examples. 2.5 MODI method and examples, 2.6 Unbalanced transportation problem and examples,
07	00	07		
Month: January			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	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.
08	00	08		
Month: February			Module/Unit: IV	Sub-units planned,
Lectures	Practicals	Total	Theory Of Games	4.1 Basics definitions, Saddle point and examples, 4.2 Algebraic method for 2×2 size game and examples, 4.3 Arithmetic method for 2×2 size game and examples, 4.4 Principal of dominance, 4.5 Dominance method and examples, 4.6 Sub-game method for $2 \times n$ & $m \times 2$ size game and examples, 4.7 Graphical method for $2 \times n$ & $m \times 2$ size game and examples
07	00	07		

G.B. Kolhe

(Mr. Mr. G. B. Kolhe)

Name and Signature of Teacher

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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Dr. S.M. Bargir

Programme - B. Sc. III

Semester - VI

Subject: Mathematics

Course Title: Metric Space (DSC03MAT61)

Month: November			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Limit and Metric Space	1.1 Limit of a function on the real line, 1.2 Metric space, 1.3 Limits in metric spaces.
05	00	05		
Month: December			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Continuous Function On Metric Space:	2.1 Functions continuous at a point on the real line, 2.2 Reformulation, 2.3 Functions continuous on a metric space, Open sets, Closed sets, 2.4 Discontinuous functions on \mathbb{R}^1
10	00	10		
Month: January			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Connectedness And Completeness:	3.1 More about open sets, 3.2 connected sets, 3.3 bounded sets and totally bounded sets, 3.4 Complete metric spaces.
10	00	10		
Month: February			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Compactness	4.1 Compact metric spaces, 4.2 Continuous functions on compact metric spaces, 4.3 Continuity of the inverse function, 4.4 Uniform continuity.
05	00	05		

(Dr. S.M. Bargir)

Name and Signature of Teacher

(Prof. S.P. Thorat)

DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

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

Programme - B. Sc. III

Semester - VI

Subject: Mathematics

Course Title: Linear Algebra (DSC03MAT62)

Month: November			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Vector Spaces	1.1 Vector Spaces, 1.2 Subspaces, Sum of Subspaces, 1.3 Quotient Spaces, 1.4 Homomorphisms or Linear Transformations, 1.5 Linear Span, 1.6 Linear Dependence and Independence
06	00	06		
Month: December			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Inner Product Spaces	2.1 Inner Product Spaces: 2.2 Norm of a Vector, 2.3 Inner product spaces, 2.4 Orthogonality, 2.5 Orthonormal Set.
10	00	10		
Month: January			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Linear Transformations	3.1 Algebra of Linear Transformations, 3.2 Invertible Linear Transformations, 3.3 Matrix of a Linear Transformation, 3.4 Dual Spaces, 3.5 Transpose of a Linear Transformation.
10	10	10		
Month: February			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Eigen Values And Eigen Vectors	4.1 Eigen Values and Eigen Vectors, 4.2 Characteristic Polynomials, 4.3 Characteristic Polynomial of a Linear Operator.
04	00	04		

(Miss. A. D. Patil)

Name and Signature of Teacher

(Prof. S. P. Thorat)
DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2026-2026

Annual Teaching Plan

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

Programme - B. Sc. III

Semester - VI

Subject: Mathematics

Course Title: DSC Practical- VI (2DSC03MAT61)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Linear Algebra	1. Vector spaces, subspace 2. Homomorphism and Isomorphism 3. linear dependence and independence 4. Basis, Inner product space, 5. Gram-schmidt orthogonalization process, 6. Matrix of a Linear Transformation, 7. Eigen Values and Eigen Vectors.
00	06	06		



(Miss. A. D. Patil)

Name and Signature of Teacher



(Prof. S.P. Thorat)

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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: 2025-2026

Annual Teaching Plan

Name of the teacher: Dr. S. M. Bargir

Programme - B. Sc. I

Semester - II

Subject: Mathematics

Course Title: DSC-PR-II(2DSC03MAT29)

Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Differential equations	1) Test the validity of the argument using truth table. 2) Show that implications without using truth table. 3) Draw the graph represented by the given adjacency matrix. 4) Find the incidence matrix of the given graphs.
00	002	02		



(Dr. S. M. Bargir)

Name and Signature of Teacher



(Prof. S.P. Thorat)

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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: 2026-2026
Annual Teaching Plan

Name of the teacher: Dr. S. M. Bargir

Programme - B. Sc. III

Semester - VI

Subject: Mathematics

Course Title: DSC Practical- VI (2DSC03MAT61)

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Metric Space	1. Metric space 2. Open ball and open set 3. Limit point of a set, in usual metric space and closure of a set. 4. Interior and Exterior of set 5. Complete space 6. Connected set.
00	06	06		



(Dr. S. M. Bargir)

Name and Signature of Teacher



(Prof. S.P. 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: 2026-2026

Annual Teaching Plan

Name of the teacher: Dr. S. M. Bargir

Programme - B. Sc. III

Semester - VI

Subject: Mathematics

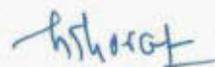
Course Title: VSC-PR-IV:(VSC03MAT69)

Month : December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Basic Elements of Scilab as a Programming Language	1.Basic elements of Scilab as a Programming Language Conditional structure: if-else conditional structure.
00	02	02		
Month : January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Basic Elements of Scilab as a Programming Language	2.Looping structure: for loop, while loop,... Functions: Defining custom functions and Programs based on it.
00	04	04		
Month :February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Recursive Functions and Plotting graph	3.Recursive Functions: Defining Recursive functions and Programs based on it. Plotting graph: Creating two dimensional graphs of simple functions
00	03	03		
Month : March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Recursive Functions and Plotting graph	4.Euler's, Euler's Modified, Runge-Kutta 2 nd Order and 4 th Order 5.Trapezoidal, Simpson's 1/3 rd And 3/8 th , Weddles
00	02	02		



(Dr. S.M. Bargir)

Name and Signature of Teacher



(Prof. SHADORAT)
DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2026-2026

Annual Teaching Plan

Name of the teacher: Mr. M. A. Jadhav

Programme - B. Sc. III

Semester - VI

Subject: Mathematics

Course Title: MIN-PR-VI(MIN03MAT69)

Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Optimization Technique	
00	09	09		1. Graphical method for linear programming problems, 2. Solution of LPP using Simplex method and Big - M method, 3. North west corner Method and Matrix minima method 4. Vogel Approximation Method, 5. MODI method, 6. Unbalanced transportation problem 7. Hungarian method and unbalanced Assignment problem, 8. Algebraic and Arithmetic method of Two by two (2 X 2) games, 9. Sub Game Method and Graphical for 2 X n, m X 2 games.



(Mr. M. A. Jadhav)

Name and Signature of Teacher



(Prof. S.P. Thorat)

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-2026

Annual Teaching Plan

Name of the teacher: Mr. M.A. Jadhav

Programme - B. Sc. III(Minor)

Semester - VI

Subject: Mathematics

Course Title: Basics of Operation Research (MIN03MAT61)

Month: November			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Linear Programming Problem	1.4 Revision of L.P.P., canonical form, standard form of L.P.P. 1.5 Solution of L.P.P by Simplex method and examples, 1.6 Solution of L.P.P by Big - M method and examples.
08	00	08		
Month: December			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Transportation Problem	2.1 Basics of Transportation problem, 2.2 Basic Definitions, Initial Solution: North - West corner method and examples, 2.3 Matrix minima method and examples, 2.4 Vogel's approximation method and examples. 2.5 MODI method and examples, 2.6 Unbalanced transportation problem and examples,
07	00	07		
Month: January			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	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.
08	00	08		
Month: February			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Theory Of Games	4.1 Basics definitions, Saddle point and examples, 4.2 Algebraic method for 2×2 size game and examples, 4.3 Arithmetic method for 2×2 size game and examples, 4.4 Principal of dominance, 4.5 Dominance method and examples, 4.6 Sub-game method for $2 \times n$ & $m \times 2$ size game and examples, 4.7 Graphical method for $2 \times n$ & $m \times 2$ size game and examples
07	00	07		



(Mr. M.A. Jadhav)

Name and Signature of Teacher



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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2026-2026
Annual Teaching Plan

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

Programme - B. Sc. III

Semester - VI

Subject: Mathematics

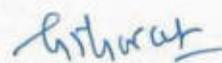
Course Title: DSC Practical- VI (2DSC03MAT61)

Month : January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Complex Analysis	
00	09	09		1. Necessary and Sufficient Condition for differentiability 2. Cauchy-Rieman Equation 3. Exponential, Logarithmic function and Branches and derivatives of logarithms. 4. Complex Exponents and Trigonometric function 5. Complex Integration 6. Cauchy integral formula 7. Derivative of Analytical function Liouville's Theorem 8. Taylor's and Laurent's Series 9. Singularity, Residues, Zeros of analytic.



(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: 2026-2026
Annual Teaching Plan

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

Programme - B. Sc. III

Subject: Mathematics

Semester - VI

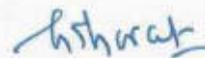
Course Title: DSC Practical- VI (2DSC03MAT61)

Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Optimization Technique	
00	09	09		1. Graphical method for linear programming problems, 2. Solution of LPP using Simplex method and Big - M method, 3. North west corner Method and Matrix minima method 4. Vogel Approximation Method, 5. MODI method, 6. Unbalanced transportation problem 7. Hungarian method and unbalanced Assignment problem, 8. Algebraic and Arithmetic method of Two by two (2 X 2) games, 9. Sub Game Method and Graphical for 2 X n, m X 2 games.



(Mr. Mr. G. B. Kolhe)

Name and Signature of Teacher



(Prof. S.P. Thorat)

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-26

ANNUAL TEACHING PLAN

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

Programme: M. Sc. I

Subject: Mathematics

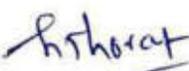
Semester: I

Course Title: Modern Algebra

Month: July			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Simple Groups	1) Permutation group, Group of symmetry, Dihedral group, Commutator subgroups Simple groups, simplicity of A_n , 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:	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:	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:	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		


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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-26

ANNUAL TEACHING PLAN

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

Programme: M.Sc. I

Subject: Mathematics

Semester: I

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		

Koshti

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Thorat

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-26

ANNUAL TEACHING PLAN

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

Programme: M.Sc. I

Subject: Mathematics

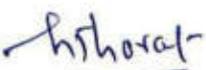
Semester: I

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 Bounded Variations: 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		


(Mr. A. A. Patil)




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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2025-26

ANNUAL TEACHING PLAN

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

Programme: M.Sc. I

Subject: Mathematics

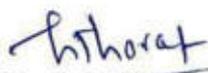
Semester: I

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		


 (Ms. A. D. Patil)




 (Dr. S. P. Thorat)
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2025-26

ANNUAL TEACHING PLAN

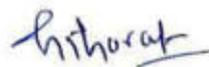
Name of the teacher: Dr. S. M. Bargir
 Programme: M. Sc. I
 Subject: Mathematics

Semester: I
 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		



(Dr. S. M. Bargir)

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-26

ANNUAL TEACHING PLAN

Name of the teacher: Dr. 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 Beamer for paper typing and presentations: Latex-typesetting , mathematics, typesetting theorems. Making presentations with LATEX-Beamer
16	00	16		

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(Dr. S. P. Thorat)



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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-26

ANNUAL TEACHING PLAN

Name of the teacher: Dr. S. M. Bargir

Programme: M. Sc. II

Subject: Mathematics

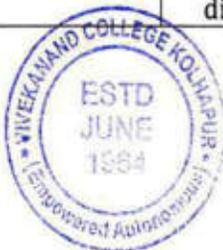
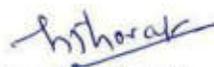
Semester: III

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		



(Dr. S. M. Bargir)

(Dr. S. Pathorat)

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Department of Mathematics

Academic Year: 2025-26

ANNUAL TEACHING PLAN

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

Programme: M. Sc. II

Subject: Mathematics

Semester: III

Course Title: Classical Mechanics

Month: July			Module/Unit:	Sub-units planned
Lectures	Practical	Total	1 Mechanics of a particle,	1.Mechanics of a particle, Mechanics of a system of particles, conservation theorems. 2.Generalised coordinates, D' Alembert's Principle, Lagrange's equations of motion, sin applications of Lagrangian formulation 3. Kinetic energy as a homogeneous function generalised velocities, Non-conservation of total energy due to the existence of non-conservative forces. 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	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.Undetermined conditions, Geodesics in a plane and space, the minimum surface of revolution, the problem Brachistochrone 3. Isoperimetric problems, problem of maximum enclosed area. Hamilton's Principle, Derivation of Hamilton's principle from D'Alembert's principle, Lagrange's equation of motion from Hamilton's principle. 4.Lagrange's equations of motion for non-conservative systems (Method of Lagrange's undetermined multipliers)
15	00	15		
Month: September			Module/Unit:	Sub-units planned
Lectures	Practical	Total	3. Hamiltonian function	1. Hamiltonian function, Hamilton's canonical equations of motion, Derivation of Hamilt equations from variational principle 2. Physical significance of Hamiltonian, the principle of 1 action 3. cyclic co-ordinates and Routh's procedure. Orthogonal transformations 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	1.The Kinematics of rigid body motion: The independent co-ordinates of a rigid body, the Eule angles 2. Euler's theorem on motion of rigid body, Angular momentum and kinetic energy rigid body with one point fixed 3. the inertia tensor and moment of inertia, Euler's equations motion, Cayley- Klein parameters 4. Matrix of transformation in Cayley- Klein parametric Relations between Eulerian angles and Cayley- Klein parameters
16	00	16		



G. B. Kolhe
(Mr. G. B. Kolhe)

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

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2025-26

ANNUAL TEACHING PLAN

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

Semester: III
 Course Title: Complex Analysis

Month: July			Module/Unit:	Sub-units planned
Lectures	Practical	Total	1. Analytic Functions	1. Power series, radius of convergence, 2. Analytic functions, zeros of an analytic function, 4. Cauchy-Riemann equations, 5. Harmonic functions, 6. Mobius transformations
18	00	18		
Month: August			Module/Unit:	Sub-units planned
Lectures	Practical	Total	2. Cauchy Integral	1. Power series representation of analytical function. 2. Liouville's theorem, Fundamental theorem of algebra, 3. Maximum modulus theorem, the index of closed curve, 4. Cauchy's theorem and integral formula, Morera's theorem.
15	00	15		
Month: September			Module/Unit:	Sub-units planned
Lectures	Practical	Total	3. Singularities	1. Counting zero's, The open mapping theorem, Goursat's Theorem. 2. Classification of singularities, Laurent series development. 3. Casorati- weierstrass theorem.
17	00	17		
Month: October			Module/Unit:	Sub-units planned
Lectures	Practical	Total	4. Residues	1. The argument principle, Rouché's theorem the maximum principle. Schwarz's lemma 2. Residues, residues and its applications to characterize conformal maps.
16	00	16		


 (Mr. A. A. Patil)




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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2025-26

ANNUAL TEACHING PLAN

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

Programme: M. Sc. II

Subject: Mathematics

Semester: III

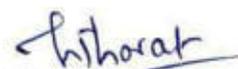
Course Title: Advanced Discrete Mathematics

Month: August			Module/Unit: I	Sub-units planned
Lectures	Practical	Total	Graph Theory	
18	00	18		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
Month: September			Module/Unit: II	Sub-units planned
Lectures	Practical	Total	Adjacency matrix	
15	00	15		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



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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2025-26

ANNUAL TEACHING PLAN

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

Semester: III
 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		


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ANNUAL TEACHING PLAN

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

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		


 (Ms. A. D. Patil)
 Name and Sign of Teacher




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ANNUAL TEACHING PLAN

Name of the teacher: Dr. S. M. Bargir

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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Department of Mathematics

Academic Year: 2025-26

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 \mathbb{R} to \mathbb{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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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, Wilson'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 τ 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		


 Ms. S. J. Koshti
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Department of Mathematics

Academic Year: 2025-26

ANNUAL TEACHING PLAN

Name of the teacher: Ms. R. R. Sawant

Programme: M. Sc. I

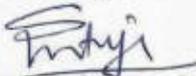
Subject: Mathematics

Semester: II

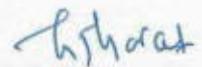
Course Title: Numerical Analysis-II

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 Simpson'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		

Rutuja Rajendra Sawant



Name and Sign of Teacher



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Department of Mathematics

Academic Year: 2025-26

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		

Patil

(Mr. A. A. Patil)
Name And Sign of Teacher



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(Prof. Dr. S. P. Thorat)

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Academic Year: 2025-26

ANNUAL TEACHING PLAN

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

G. B. Kolhe

(Mr. Gaurav B. Kolhe)

Name And Sign of Faculty



S. P. Thorat

(Prof. S. P. Thorat)

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Department of Mathematics

Academic Year: 2025-26

ANNUAL TEACHING PLAN

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

Programme: M. Sc. II

Subject: Mathematics

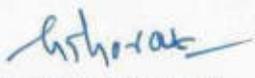
Semester: IV

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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Vivekanand College Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2025-26

ANNUAL TEACHING PLAN

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

Semester-IV

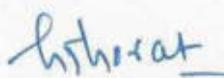
Subject: Mathematics

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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