SALBARI COLLEGE		
Teaching Plan (Session 2025-26)		
Class: B.Sc 1st year Semester: I		
Subject: Mathematics		
Paper Title: Foundation of Mathematics Paper Code: MATMAJ101-4		
Teacher's Name: Parameswar Basumatary		
Unit	**Lecture No.**	**Topic**
Unit-1 (Basics of Real Analysis)	1.	Basic Concepts of Relations
	2.	Types of relations
	3.	Equivalence relations
	4.	Equivalence Classes and partitions of a set
	5.	Basic Concepts of Functions
	6.	Types of functions
	7.	Composition of functions
	8.	Inverse of a function
	9.	Image image of subsets under functions
	10.	Inverse image of subsets under functions
	11.	Class Test-1

Prescribed Textbooks:

[1] A Foundation Course in Mathematics, A. Kumar, S. Kumaresan, B. K. Sarma, Alpha Science International Ltd. Oxford, U.K.

SALBARI COLLEGE		
Teaching Plan (Session 2025-26)		
Class: B.Sc 1st year Semester: I		
Subject: Mathematics		
Paper Title: Foundation of Mathematics (Practical) Paper Code: MATMAJ101-4		
Teacher's Name: Parameswar Basumatary		
Unit	**Lecture No.**	**Topic**
Practical (Software to be used Wolfram Mathematic)	1.	Construction of matrices,
	2.	
	3.	Algebraic operations of Matrices
	4.	Elementary operations of matrices
	5.	Partitions of matrices
	6.	Determinant of a matrix
	7.	Rank of a Matrix
	8.	Adjoint of a matrix
	9.	Inverse of a matrix
	10.	Solutions of a system of linear equations
	11.	
	12.	
	13.	Problem Solving Session
	14.	Review and Clarification Session
	15.	Class Test-1

SALBARI COLLEGE		
Teaching Plan (Session 2025-26)		
Class: B.Sc 1st year Semester: I		
Subject: Mathematics		
Paper Title: Foundation of Mathematics (Minor) Paper Code: MATMIN101-4		
Teacher's Name: Parameswar Basumatary		
Unit	**Lecture No.**	**Topic**
Unit-2 (Matrices)	1.	Basic concepts of matrices
	2.	Types of matrices
	3.	Transpose, trace and determinant of a matrix
	4.	Elementary operations
	5.	Row Reduced echelon form
	6.	Rank and inverse of a matrix
	7.	Normal form of a matrix
	8.	Solutions of a system of linear equations
	9.	
	10.	Symmetric, skew-symmetric and orthogonal matrices
	11.	Eigenvalues, and eigenvectors
	12.	
	13.	Diagonalization of matrices
	14.	
	15.	Cayley-Hamilton theorem.
	16.	Review and Clarification Session
	17.	Class Test-1

Prescribed Textbooks:

[1] Seymour Lipschutz; Marc Lipson: Schaum's Outline of Linear Algebra, McGraw-Hill Education, Schaum's Outlines, 4, 2008.

Reference Books:

[1] Herstein I. N. & Winter D. J. - Matrix theory and linear algebra Macmillan Pub Co, 1988

SALBARI COLLEGE		
Teaching Plan (Session 2025-26)		
Class: B.Sc 1st year Semester: II		
Subject: Mathematics		
Paper Title: Calculus		Paper Code: MATMAJ102-4
Teacher's Name: Parameswar Basumatary		
Unit	**Lecture No.**	**Topic**
Unit-1	1.	Basic Concepts of Limits and Continuity
	2.	
	3.	
	4.	Differentiability and properties
	5.	
	6.	Properties of continuous functions
	7.	
	8.	nth Derivatives of Standard functions e^{ax+b}, $(ax+b)^n$, log(ax +b), sin(ax+b), cos(ax+b), $e^{axsin(bx+c)}$, $e^{axcos(bx+c)}$
	9.	
	10.	Derivatives hyperbolic functions
	11.	
	12.	Leibnitz theorem and its application.
	13.	
	14.	Review and Clarification Session
	15.	Class Test-1
Unit-2	16.	Intermediate value theorem
	17.	
	18.	Rolle's Theorem
	19.	
	20.	Lagrange's Mean Value theorem and Cauchy's Mean value theorem
	21.	
	22.	
	23.	Taylor's theorem and Maclaurin's series
	24.	
	25.	
	26.	Indeterminate forms hyperbolic function and evaluation of limits using L'Hospital's rule
	27.	
	28.	
	29.	Review and Clarification Session
	30.	Class Test-2

Prescribed Textbook:

[1] Shanti Narayan, Differential Calculus - S. Chand & Company, NewDelhi.

[2] B. C.Das and B.N Mukherjee, Calculus , U,N, DHUR & SONS PRIVATELTD

SALBARI COLLEGE		
Teaching Plan (Session 2025-26)		
Class: B.Sc 2nd year Semester: III		
Subject: Mathematics		
Paper Title: Elements of real analysis Paper Code: MATMAJ201-4		
Teacher's Name: Parameswar Basumatary		
Unit	**Lecture No.**	**Topic**
Unit-1 (Basics of Real Analysis)	31.	The Algebraic and Order Properties of $\mathbb{R}$
	32.	Inequalities including Bernoulli's Inequality
	33.	Absolute value and the real line
	34.	Neighbourhood of a point
	35.	Review and Clarification Session
	36.	Bounded above and bounded below sets, Suprema and infima
	37.	The completeness property of $\mathbb{R}$ and $\mathbb{Q}$
	38.	Applications of the supremum property,
	39.	
	40.	Archimedean Property of $\mathbb{R}$
	41.	Density of rational numbers in $\mathbb{R}$
	42.	
	43.	Intervals, (up to Nested Interval Property)
	44.	Countable and uncountable sets
	45.	
	46.	Countability of $\mathbb{Z}$, $\mathbb{R}$, $\mathbb{N} \times \mathbb{N}$, $\mathbb{Q}$, [0, 1] and related theorems
	47.	
	48.	
	49.	Review and Clarification Session
	50.	Class Test-1
Unit-2 (Sequences of Real Numbers)	51.	Introduction to Sequences
	52.	The limit of a sequence with examples and related theorems
	53.	
	54.	Bounded sequence
	55.	Limit Theorems
	56.	Squeeze theorem
	57.	Monotone Sequences
	58.	Monotone Convergence Theorem
	59.	Euler's Number
	60.	Review and Clarification Session
	61.	Subsequences
	62.	Divergence Criteria

	63.	Bolzano Weierstrass Theorem for Sequences
	64.	Monotone Subsequence Theorem
	65.	Review and Clarification Session
	66.	Cauchy sequence
	67.	Cauchy's Convergence Criterion with applications.
	68.	
	69.	Review and Clarification Session
	70.	Class Test-2
Unit-3 (Infinite Series of Real Numbers)	71.	Basic concepts and examples
	72.	General Term Test
	73.	Grouping
	74.	Cauchy Criterion for convergence of series
	75.	Linearity of sums of series
	76.	Review and Clarification Session
	77.	Nonnegative series
	78.	The Integral Test
	79.	p-series
	80.	Comparison Test
	81.	Limit Comparison Test
	82.	Ratio Test
	83.	Root Test
	84.	Alternating series Test
	85.	Absolute and Conditional convergence
	86.	Review and Clarification Session
	87.	Class Test-3
	88.	Class Test-4
	89.	Class Test-5
	90.	Class Test-6

Prescribed Textbooks:

[1] Bartle, Robert G., & Sherbert, Donald R. (2015). *Introduction to Real Analysis* (4th ed.). Wiley India Edition. New Delhi (**For Units-1 & 2**).
[2] Denlinger, Charles G. (2011). *Elements of Real Analysis*. Jones & Bartlett India Pvt. Ltd. Student Edition. Reprinted 2015(**For Units 3**).

Reference Books:

[1] Ross, Kenneth A. (2013). *Elementary Analysis*: *The Theory of Calculus* (2nd ed.). Undergraduate Texts in Mathematics, Springer. Indian Reprint.
[2] Thomson, Brian S., Bruckner, Andrew. M., & Bruckner, Judith B. (2001). *Elementary Real Analysis.* Prentice Hall.

SALBARI COLLEGE		
Teaching Plan (Session 2025-26)		
Class: B.Sc 2nd year Semester: Third		
Subject: Mathematics		
Paper Title: SciLab Paper Code: MATSEC201-3		
Teacher's Name: Parameswar Basumatary		
Unit	**Lecture No.**	**Topic**
Unit-1 (Overview of Scilab)	1.	Introduction to Scilab and its features
	2.	
	3.	Installing Scilab on different platforms
	4.	
	5.	Different data types in Scilab
	6.	
	7.	
	8.	Basic arithmetic and logical operators in Scilab Expressions and their evaluation in Scilab
	9.	
	10.	
	11.	
	12.	
	13.	Variables and arrays
	14.	
	15.	
	16.	Initialising variables in Scilab
	17.	
	18.	
	19.	Multidimensional arrays
	20.	
	21.	Class Test-1
Unit-2 (Applications of Scilab)	22.	Basic plot commands in Scilab
	23.	
	24.	Plotting 2D and 3D graphs in Scilab
	25.	
	26.	
	27.	Formatting and customizing plots
	28.	
	29.	
	30.	
	31.	Saving and exporting graphs
	32.	
	33.	
	34.	Matrices and vectors in Scilab
	35.	
	36.	
	37.	Numerical integration and differentiation in Scilab
	38.	
	39.	
	40.	
	41.	

	42.	
	43.	Review and Clarification Session
	44.	Class Test-2
	45.	Class Test-3
	46.	Class Test-4

Prescribed Textbooks:

[1] Sandeep Nagar, *Introduction to Scilab: For Engineers and Scientists*,Apress (2017).

Reference Books:

[1] Er. Hema Ramachandran, Dr. Achuthsankar S. Nair, *Computer SCILAB-A free software to MATLAB*, S Chand (2011).

[2] Anil Kumar Verma, *SCILAB: A Beginner's Approach*, Cengage Learning India Pvt. Ltd
(2018).

SALBARI COLLEGE		
Teaching Plan (Session 2025-26)		
Class: B.Sc 2nd year Semester: IV		
Subject: Mathematics		
Paper Title: Numerical Methods		Paper Code: MATMAJ204-4
Teacher's Name: Parameswar Basumatary		
Unit	**Lecture No.**	**Topic**
Unit-1 (Methods for Solving Algebraic and Transcendental Equations)	1.	Bisection method with its rate of convergence
	2.	
	3.	
	4.	
	5.	Method of false position
	6.	
	7.	
	8.	
	9.	Secant method
	10.	
	11.	
	12.	
	13.	Newton's method
	14.	
	15.	
	16.	
	17.	Problem Solving Session
	18.	
	19.	Review and Clarification Session
	20.	Class Test-1
Unit-2 (Methods for solving systems of linear equations and interpolation)	21.	Gaussian Elimination Method
	22.	
	23.	Gauss Jordan Method
	24.	
	25.	LU decomposition method
	26.	
	27.	Gauss Jacobi method
	28.	
	29.	Gauss Seidel method
	30.	
	31.	Errors: Round off, Truncation, Absolute, Relative and Percentage
	32.	Lagrange interpolation
	33.	
	34.	Newton interpolation
	35.	
	36.	Finite difference operators
	37.	
	38.	Problem Solving Session

	39.	Review and Clarification Session
	40.	Class Test-1
Unit-3 (Numerical Differentiation and Integration)	41.	First and higher order approximation for the first derivative
	42.	
	43.	
	44.	Approximation for the second derivative
	45.	
	46.	Numerical integration by closed Newton-Cotes formulae: Trapezoidal rule
	47.	
	48.	
	49.	Simpson's rule
	50.	
	51.	Euler's method to solve ODE's
	52.	
	53.	Modified Euler method
	54.	
	55.	Runge-Kutta Method (fourth-order)
	56.	
	57.	
	58.	Problem Solving Session
	59.	Review and Clarification Session
	60.	Class Test-1

Text Books:

[1] Bradie, Brian. (2006). A Friendly Introduction to Numerical Analysis. Pearson Education India. Dorling Kindersley (India) Pvt. Ltd. Third impression 2011. **(For all Units)**

[2] M. K. Jain, S. R. K. Iyengar and R. K. Jain, Numerical Methods for Scientific and Engineering Computation, New age International Publisher, India, 5th edition, 2007. (**Unit-2**)

Reference Books:

[1] C.F. Gerald and P.O. Wheatley, Applied Numerical Analysis, Pearson Education, India, 2008.

[2] B.S. Grewal, Numerical Methods in Engineering and Science.

SALBARI COLLEGE		
Teaching Plan (Session 2025-26)		
Class: B.Sc 2nd year Semester: IV		
Subject: Mathematics		
Paper Title: Practical (Numerical Methods)		Paper Code: MATMAJ204-4
Teacher's Name: Parameswar Basumatary		
Unit	**Lecture No.**	**Topic**
Practical	1.	Bisection Method.
	2.	
	3.	Secant Method
	4.	
	5.	Newton-Raphson Method
	6.	
	7.	Gauss Elimination method
	8.	
	9.	L U decomposition Method
	10.	
	11.	Gauss-Jacobi Method
	12.	
	13.	Gauss-Seidel method
	14.	
	15.	Lagrange interpolation
	16.	
	17.	Newton interpolation
	18.	
	19.	Trapezoidal rule
	20.	
	21.	Simpson's rule
	22.	
	23.	Euler’s method
	24.	
	25.	Runge-Kutta Method (fourth-order)
	26.	
	27.	Problem Solving Session
	28.	

	29.	Review and Clarification Session
	30.	Class Test-1

SALBARI COLLEGE		
Teaching Plan (Session 2025-26)		
Class: B.Sc 3nd year Semester: V		
Subject: Mathematics		
Paper Title: Metric Space		Paper Code: MATMAJ302-4
Teacher's Name: Parameswar Basumatary		
Unit	**Lecture No.**	**Topic**
Unit-1 (Introduction to Metric Spaces)	1.	Basic Concepts of Metric Space
	2.	Examples of Metric space
	3.	More Examples on Metric Spaces
	4.	Sequences in metric spaces and examples with their convergence
	5.	
	6.	
	7.	Cauchy Sequences
	8.	
	9.	Subsequences
	10.	Complete metric spaces
	11.	
	12.	Completion of a metric space
	13.	
	14.	Review and Clarification Session
	15.	Class Test-1
Unit-2 (Topology of a	16.	Concepts of Open ball and Closed ball with examples
	17.	Concepts of Neighbourhood with examples
	18.	Open set and related theorems
	19.	
	20.	Interior of a set
	21.	Limit point of a set and Derived set
	22.	

Metric Space)		
	23.	Closed set and Closure of a set and realted theorems
	24.	
	25.	
	26.	Diameter of a set
	27.	Cantor's theorem
	28.	
	29.	Review and Clarification Session
	30.	Class Test-2
Unit-3 (Continuity and Uniform Continuity in Metric Spaces)	31.	Definitions of Continuous Mappings with examples
	32.	Sequential criterion and other characterizations of continuity
	33.	
	34.	
	35.	Extension Theorems
	36.	
	37.	Uniform continuity and its characterizations
	38.	
	39.	
	40.	Urysohn’s lemma
	41.	Homeomorphism, Isometry and equivalent metrics
	42.	
	43.	
	44.	Review and Clarification Session
	45.	Class Test- 3
Unit-4 (Connectedness and Compactness)	46.	Connectedness and Connected subsets of $\mathbb{R}$
	47.	
	48.	
	49.	Connectedness and continuous mappings
	50.	
	51.	Compactness and boundedness
	52.	
	53.	Characterizations of compactness
	54.	
	55.	
	56.	Continuous functions on compact spaces
	57.	
	58.	
	59.	Review and Clarification Session
	60.	Class Test- 4

Prescribed Textbooks:

[1] Shirali, Satish & Vasudeva, H. L. (2009). Metric Spaces. Springer. Indian Reprint 2019.

Reference Books:

[1] Kumaresan, S. (2014). Topology of Metric Spaces (2nd ed.). Narosa Publishing House. New Delhi.

[2] Rudin, Walter. Principles of Mathematical Analysis (3rd ed.).

[3] Simmons, George F. (2004). Introduction to Topology and Modern Analysis. McGraw-Hill Education. New Delhi.

SALBARI COLLEGE		
Teaching Plan (Session 2025-26)		
Class: B.Sc 3rd year Semester: V		
Subject: Mathematics		
Paper Title: Multivariate Calculus		Paper Code: MATMAJ303-4
Teacher's Name: Parameswar Basumatary		
Unit	**Lecture No.**	**Topic**
Unit-2 (Extrema of Functions up to three variables)	1.	First and second partial derivative tests for relative extrema of functions of two variables
	2.	
	3.	
	4.	Absolute extrema of continuous functions
	5.	
	6.	Method of Lagrange multipliers
	7.	
	8.	Constrained optimization problems
	9.	
	10.	Review and Clarification Session
	11.	Class Test- 1

Prescribed Textbook:

[1] Strauss, Monty J., Bradley, Gerald L., & Smith, Karl J. (2007). Calculus (3rd ed.). Dorling Kindersley (India) Pvt. Ltd. (Pearson Education). Delhi. Indian Reprint 2011. Department of Mathematics, University of Delhi 27.

Reference Books:

[1] Marsden, J. E., Tromba, A., & Weinstein, A. (2004). Basic Multivariable Calculus. Springer (SIE). First Indian Reprint.

[2] James Stewart “Multivariate Calculus: Concepts and Contexts” 3rd edition

[3] Thomas’ Calculus by Joel Hass, Christopher Heil, Maurice D. Weir, Pearson India Service Ltd. ,14 edition.

[4] Calculus (10th edition) by H. Anton, I. Bivens and S. Davis; Wiley India Pvt. Ltd.