



SILVER OAK UNIVERSITY

College of Technology (01)

Bachelor of Technology in AE/CH/CE/IT/EC/CL/EE/ME

Subject Name: Mathematics-1

Subject Code: 1010273101

Semester: I

Prerequisite:

1. Algebra, Trigonometry, Geometry and calculus

Objective:

1. The study of rate of changes, understanding to compute area, volume and express the function in terms of series, to apply matrix algebra.

Teaching and Examination Scheme:

Teaching Scheme					Evaluation Scheme				Total Marks
L	T	P	Contact Hours	Credits	Theory		Practical		
					CIE (TH)	ESE (TH)	CIE (PR)	ESE (PR)	
3	2	0	5	5	40	60	--	--	100

Content:

Unit No.	Course Contents	Teaching Hours	Weightage %
1	Indeterminate Forms and L'Hôpital's Rule.	02	5%
	Evolutes and involutes; Evaluation of definite and improper integrals; Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions.	06	15%
2	Sequences and series : Convergence of sequence and series, tests for convergence; Power series, Taylor's series, series for exponential, trigonometric and logarithm functions; Fourier series: Half range sine and cosine series, Parseval's theorem.	12	30%
3	Multivariable Calculus (Differentiation): Limit, continuity and partial derivatives, total derivative; Tangent plane and normal line; Maxima, minima and saddle points; Method of Lagrange multipliers;	08	20%
4	Vector Differential Calculus: Vector and Scalar Fields Gradient, curl and divergence, directional derivatives, Conservative fields, component test for conservative fields	02	5%
5	Matrices: Elementary row operations, Inverse and rank of a matrix using row operations, rank-nullity theorem; System of linear equations; Symmetric, skew symmetric and orthogonal matrices;	10	25%

	Determinants; Eigenvalues and eigenvectors; Cayley-Hamilton Theorem, Diagonalization of matrices; and Orthogonal transformation.		
		40	100%

Course Outcome:

Sr. No.	CO statement	Unit No
CO-1	To apply differential and integral calculus to improper integrals and to determine applications of definite integral. Apart from some other applications they will have a basic understanding of indeterminate forms, Beta and Gamma functions	1
CO-2	To apply the various tests of convergence to sequence, series and the tool of power series and fourier series for learning advanced Engineering Mathematics.	2
CO-3	To compute partial derivative, maximum or minimum rate of change and optimum value of functions of several variables.	3
CO-4	To compute directional derivative	4
CO-5	To perform matrix computation in a comprehensive manner.	5

Teaching & Learning Methodology: -

- (i) Focus on tricks of the trade and intuitive idea of Concept, use the main theorems as tools, no compromise on rigour, illustrative exercises under each topic, view point of applications
- (ii) Tutorial and Teacher guided Problem solving based pedagogy
- (iii) Topic based seminars, internet based assignments, teacher guided self-learning activities

List of Experiments/Tutorials: Unit wise/Topic wise Tutorials/Teacher Guided Problem Solving Sets are to be given for Practice and better understanding of Concepts and applications

Major Equipment: Nil

Books Recommended:-

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, John Wiley and Sons.
2. James Stewart, Calculus: Early Transcendentals with Course Mate, 7e, Cengage, 2012.
3. Anton and Rorres, Elementary Linear Algebra, Applications version,, Wiley India Edition.

List of Open Source Software/learning website: Scilab, MIT Opencourseware.