



SILVER OAK UNIVERSITY

Engineering and Technology (Diploma)

All Departments

Subject Name: Mathematics-2

Semester: 2

Prerequisite: Algebra, Trigonometry, Geometry and differential calculus

Objective: This course is designed to give a comprehensive coverage at an introductory level to the subject of matrices, Integral Calculus coordinate geometry, Basic elements of vector algebra and First Order Differential Equations.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Evaluation Scheme				Total Marks
L	T	P		Internal		External		
				Th	Pr	Th	Pr	
2	2	0	4	40	--	60	--	100

Content:

Unit No.	Course Contents	Teaching Hours	Weightage %
1	Determinants and Matrices: Elementary properties of determinants up to 3rd order, consistency of equations, Cramer's rule. Algebra of matrices, Inverse of a matrix, matrix inverse method to solve a system of linear equations in 3 variables.	10	25%
2	Integral Calculus: Integration as inverse operation of differentiation. Simple integration by substitution, by parts and by partial fractions (for linear factors only). Use of formulas $\int_0^{\pi/2} \sin^n x dx$, $\int_0^{\pi/2} \cos^n x dx$ and $\int_0^{\pi/2} \sin^n x \cos^m x dx$ and for solving problems Where m and n are positive integers. Applications of integration for i. Simple problem on evaluation of area bounded by a curve and axes. ii. Calculation of Volume of a solid formed by revolution of an area about axes. (Simple problems).	10	25%
3	Co-Ordinate Geometry : Equation of straight line in various standard forms (without proof), inter section of two straight lines, angle between two lines. Parallel and perpendicular lines, perpendicular distance formula. General equation of a circle and its characteristics. To find the equation of a circle, given: i. Centre and radius, ii. Three points lying on it and iii. Coordinates of end points of a diameter; Definition of conics (Parabola, Ellipse, Hyperbola) their standard equations without proof. Problems on conics when their foci,	10	25%

	directories or vertices are given.		
4	Vector Algebra: Definition notation and rectangular resolution of a vector. Addition and subtraction of vectors. Scalar and vector products of 2 vectors. Simple problems related to work, moment and angular velocity.	04	10%
5	Differential Equations Solution of first order and first degree differential equation by variable separation method (simple problems). MATLAB – Simple Introduction.	06	15%
		40	100%

Course Outcome:

Sr. No.	CO statement	Unit No
CO-1	To acquire necessary background in Determinants and Matrices so as to appreciate the importance of the Determinants are the factors that scale different parameterizations so that they all produce same overall integrals, i.e. they are capable of encoding the inherent geometry of the original shape.	1
CO-2	To study the cumulative effect of the original quantity or equation is the Integration	2
CO-3	To understand the coordinate geometry this provides a connection between algebra and geometry through graphs of lines and curves.	3
CO-4	To get acquainted with concepts to vector algebra	4
CO-5	Tell the difference between a resultant and a concurrent force to model simple physical problems in the form of a differential equation, analyze and interpret the solutions.	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. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40th Edition, 2007
2. G. B. Thomas, R. L. Finney, Calculus and Analytic Geometry, Addison Wesley, 9th Edition, 1995
3. Reena Garg, Engineering Mathematics, Khanna Publishing House, New Delhi (Revised Ed. 2018)
4. Comprehensive Mathematics, Vol. I & II by Laxmi Publications, Delhi

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