Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous Institute Affiliated to University of Mumbai)

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
BS41	Applied Mathematics-II	3	1	--	3	1	--	4
		Examination Scheme						
		ISE		MSE	ESE			
		10		30	100 (60% Weightage)			

Pre-requisite Course Codes		BS11 (Engineering Mathematics I) BS21 (Engineering Mathematics II)
After successful completion of the course, student will be able to		
Course Outcomes	CO1	To diagonalise a given matrix and calculate functions of a square matrix
	CO2	To reduce a given quadratic form to simpler forms
	CO3	To apply the concept of complex analysis to evaluate integrals
	CO4	To evaluate line integrals and surface integrals.
	CO5	To calculate expectation, variance and moments of a random variable
	CO6	To apply the concepts of matrices to real life problems

Module No	Module Name	Unit No	Topics	Ref	Hours
1.	**Linear Algebra: Matrix Theory**	**1.1**	Eigenvalues and Eigenvectors, properties of Eigenvalues and Eigenvectors	1,2,3,7	03
		1.2	Cayley-Hamilton theorem and its applications.		01
		1.3	Similarity of matrices, Diagonalisation of matrix		02
		1.4	Application of diagonalisation of matrices to find functions of a square matrix and to solve a system of ODE		02
		1.5	Quadratic forms over real field, Singular Value Decomposition		05
		1.6	Application to find google page rank		02
2.	**Complex Variables: Integration**	**2.1**	Line Integral, Cauchy's Integral theorem for simply connected regions, Cauchy's Integral formula	1,2,3,4	05
		2.2	Region of Convergence, Taylor's and Laurent's series		02

		2.3	Zeros, singularities, poles of f(z), residues, Cauchy's Residue theorem		04
		2.4	Applications of Residue theorem to evaluate real Integrals of different types		03
3.	**Vector Integration: Line and Surface Integrals**	**3.1**	Line and Surface Integrals, Circulation of a vector, Greens theorem in a plane, Gauss divergence theorem, Stokes theorem	1,2,3,4	06
4.	**Probability: Random Variables**	**4.1**	Discrete and continuous random variables (Single and Joint), probability density function, cumulative density function, expectation, variance. Moments and Moment generating function.	1,2,3,4,5,6	07
				Total	42 Hrs

References:

[1] Kreyszig, "Advanced Engineering Mathematics, 9th edition", John Wiley
[2] H.K.Dass, "Advanced Engineering Mathematics", 28th edition, S.Chand, 2010
[3] Grewal B.S., "Higher Engineering Mathematics", 38th edition, Khanna Publication
[4] Thomas & Finney,"Calculus& Analytic Geometry", 9th edition, Addison Wesley.
[5] Kishor S. Trivedi, "Probability & Statistics with reliability", 2nd edition, Wiley India
[6] Sheldon M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists"
[7] H Anton and C Rorres," Elementary Linear Algebra Application Version", 6th edition, John Wiley & Sons, 2010