K. J. Somaiya College of Engineering, Mumbai-77

LESSON PLANNING SHEET

Name of College : K.J. Somaiya College Of Engineering , SVU					Department of Science & Humanities Year 2021-22 Odd Term													
Name of the Subject	Semester	Division	Name of Faculty	No. of Students		Per week			Nature of Students [Own department / depts. Serviced]									Mapping with CO
						Lect.	Tut.	Pract.										
Applied Mathematics - I	I	P3,P4,P5	Dr. Rachana Desai			L	T	P	Department of Science and Humanities/ Computer Engineering									
						3	1		Serviced Department									

Sr. No.	Topics Covered	Theory Coverage (TC)							Tutorial Support (TS)		Laboratory Support (LS)				Books Referred	Date Engaged			Mapping with CO
		Live online sessions/ Whiteboard	Active learning techniques	Computerized Slides	Discussion Forums/Group Discussion	Social Media	Students Presentations/Submissions	Quizes and Polls	Exercises	Assignments	Lab Expt.	Demo Expt.	Simulation	Industrial Visit		DIV P3	DIV P4	DIV P5	
Module 1: Complex Numbers																			
L1	Introduction of Complex numbers		√	√	√	√	√	√	√	√					T1, T3				CO1
L2	Introduction of Complex numbers		√	√	√	√		√	√	√					T1, T3				CO1
L3	De- Moivre's Theorem and Applications		√	√	√	√		√	√	√					T1, T3				CO1
L4	De- Moivre's Theorem and Applications		√	√	√	√	√	√	√	√					T1, T3				CO1
L5	Roots of Complex Numbers		√	√	√	√		√	√	√					T1, T3				CO1
L6	Roots of Complex Numbers		√	√	√	√		√	√	√					T1, T3				CO1
L7	Hyperbolic and circular functions and their reletions		√	√	√	√		√	√	√					T1, T3				CO1
L8	Separation of real and imaginary parts		√	√	√	√		√	√	√					T1, T3				CO1
L9	Inverse circular & Inverse Hyperbolic Functions		√	√	√	√		√	√	√					T1, T3				CO1
L10	Problems based on hyperbolic and inverse hyperbolic funcions		√	√	√	√		√	√	√					T1, T3				CO1
L11	Logarithms of complex Numbers		√	√	√	√		√	√	√					T1, T3				CO1
L12	Problems based on Logarithms funcions		√	√	√	√		√	√	√					T1, T3				CO1

Module 2: Matrix Theory- Rank of Matrix																			
L13	Types of matrices		√	√	√	√		√	√	√					T2, T3				CO2
L14	Orthogonal and Unitary Matrices		√	√	√	√		√	√	√					T2, T3				CO2
L15	Rank of a Matrix and Normal Form		√	√	√	√		√	√	√					T2, T3				CO2
L16	Rank And Normal form PAQ		√	√	√	√		√	√	√					T2, T3				CO2
L17	Non-Homogeneous system of equations and its solution		√	√	√	√		√	√	√					T2, T3				CO2
L18	Homogeneous system of equations and its solution		√	√	√	√		√	√	√					T2, T3				CO2
L19	Linearly dependent and independent vectors		√	√	√	√		√	√	√					T2, T3				CO2
L20	Gauss Seidal Method, Gauss Jacobi Method		√	√	√	√		√	√	√					T2, T3				CO2
Module 3: Matrix theory : Eigen values and Eigen vectors																			
L21	Characteristic equation, Eigenvalues and Eigenvectors		√	√	√	√		√	√	√					T1,T2,T3				CO3
L22	Find Eigenvalues and Eigenvectors		√	√	√	√		√	√	√					T1,T2,T3				CO3
L23	Properties of Eigenvalues and Eigenvectors and related problems		√	√	√	√		√	√	√					T1,T2,T3				CO3
L24	Cayley-Hamilton theorem and its verification		√	√	√	√		√	√	√					T1,T2,T3				CO3
L25	Application of Cayley - Hamilton theorem		√	√	√	√		√	√	√					T1,T2,T3				CO3
L26	Similarity of matrices		√	√	√	√		√	√	√					T1,T2,T3				CO3
L27	Diagonalisation of matrices		√	√	√	√		√	√	√					T1,T2,T3				CO3
L28	Problems and results on Diagonalisation		√	√	√	√		√	√	√					T1,T2,T3				CO3
L29	Functions of square matrix,		√	√	√	√		√	√	√					T1,T2,T3				CO3
L30	Functions of square matrix,		√	√	√	√		√	√	√					T1,T2,T3				CO3
L31	Theory of Annihilator of matrix and minimal polynomial		√	√	√	√		√	√	√					T1,T2,T3				CO3
L32	Minimal polynomial problems		√	√	√	√		√	√	√					T1,T2,T3				CO3

Module 4 Partial Differentiation and application																			
L33	Function of several variables		√	√	√	√		√	√	√					T1,T3				CO4
L34	Partial derivatives of first order & Higher order		√	√	√	√		√	√	√					T1,T3				CO4
L35	Examples related Partial derivatives of first order & higher ordr		√	√	√	√		√	√	√					T1,T3				CO4
L36	Differentiation of composite functions		√	√	√	√		√	√	√					T1,T3				CO4
L37	Differentiation of composite functions and total differentials		√	√	√	√		√	√	√					T1,T3				CO4
L38	total differentials		√	√	√	√		√	√	√					T1,T3				CO4
L39	Maxima- Minima of a function of two independent variables		√	√	√	√		√	√	√					T1,T3				CO4
L40	Maxima- Minima of a function of two independent variables		√	√	√	√		√	√	√					T1,T3				CO4
L41	Introduction of Jacobian & examples		√	√	√	√		√	√	√					T1,T3				CO4
Module 5: Homogeneous functions																			
L42	Eulers Theorem for homogeneous function of two		√	√	√	√		√	√	√					T1,T3				CO5
L43	Euler's Theorem for three variables with proof		√	√	√	√		√	√	√					T1,T3				CO5
L44	Problems on Euler's theorem & corollaries		√	√	√	√		√	√	√					T1,T3				CO5
L45	Problems on Euler's theorem & corollaries		√	√	√	√		√	√	√					T1,T3				CO5

Text Books				
No.	**Name/s of Author/s**	**Title of Book**	**Name of Publisher with country**	**Edition and Year of Publication**
T1	B. S. Grewal	Higher Engineering Mathematics	Khanna Publications, India	43rd Edition 2014
T2	Shanti Narayan	A text book of Matrices	S. Chand, India	10th Edition 2004
T3	P. N. Wartikar and J. N. Wartikar	A text book of Applied Mathematics Vol I & II	Pune VidyarthiGruha, India	6th Edition 2012

Reference Books				
R1	Erwin Kreyszig	Advanced Engineering Mathematics	Wiley Eastern Limited, India	10th Edition 2015
R2	Dennis G. Zill and Michael R. Cullen	Advanced Engineering Mathematics	Narosa Publication India	3rd Edition 2010
R3	Glyn James	Advanced Modern Engineering Mathematic	Pearson Publication India	4th Edition 2010
R4	Ramana B.V.	Higher Engineering Mathematics	Tata Mcgraw Hill New Delhi, India	34th Edition (reprint) 2019