SREE VIDYANIKETHAN ENGINEERING COLLEGE(Autonomous)

Sree Sainath Nagar, A. Rangampet – 517 102

LESSON PLAN

Name of the Subject: **MATRICES AND NUMERICAL METHODS (14BT3BS01)**

Class & Semester: II B.Tech I Semester

Name of the faculty Member: **Branch:**

S. No.	Topic	No. of periods	Book(s) followed	Remarks
UNIT-I: MATRIX THEORY AND APPLICATIONS				
1	Rank of a matrix - Echelon form	1	T 1	
2	Diagnostic test - Normal form	1	T 1	
3	Inverse of a matrix by row operations	1	T 1	
4	Tutorial	1		
5	Homogenous system of Linear equations	1	T 1	
6	Non Homogenous Linear systems - consistency and solutions of linear system of equations	1	T 1	
7	Gauss elimination method	1	T 1	
8	Tutorial	1		
9	Eigen values - Eigen vectors	1	T 1	
10	Properties of Eigen values	1	T 1	
11	Cayley Hamilton Theorem(without proof) - Inverse of a matrix using Cayley Hamilton Theorem	1	T 1	
12	Tutorial	1		
13	Formative test - powers of a matrix using Cayley Hamilton Theorem	1	T 1	
Total periods required:		**1**		**3**
UNIT-II: NUMERICAL SOLUTIONS, CURVE FITTING AND INTERPOLATION				
13	Solutions of Equations by Bisection method	1	T 1	
14	Solutions of equations by Regula -falsi Method	1	T 1	
15	Tutorial	1		
16	Solutions of equations by Newton Raphson's Method	1	T 1	
17	Fitting of a straight line by least square method	1	T 1	
18	Fitting a parabola by least square method	1	T 1	
19	Tutorial	1		
20	Fittingof exponential curve by least square method	1	T 1	
21	Interpolation - Forward, back ward and central difference operators and Interpolation by Newton's forward formula	1	T 1	
22	Interpolation by Newton's backward formula	1	T 1	
23	Tutorial	1		
24	Formative test - Interpolation by Lagrange's interpolation formula	1	T 1	
Total periods required:		**1**		**2**
UNIT-III: NUMERICAL DIFFERENTIATION INTEGRATION AND SOLUTIONS OF ODE				
25	Numerical differentiation using Newton's forward formula	1	T 1	

26	Numerical differentiation using Newton's backward formula	1	T 1	
27	Tutorial	1		
28	Numerical integration by Trapezoidal rule	1	T 1	
29	Numerical integration by Simpsons 1/3 rule	1	T 1	
30	Numerical integration by Simpsons 3/8 rule	1	T 1	
31	Tutorial	1		
32	Numerical Solutions of Ordinary Differential Equations - Euler's method - Euler's modified method	1	T 1	
33	Euler's modified method	1	T 1	
34	Formative test- Runge – Kutta method (4^{th} Order only)	1	T 1	
35	Tutorial	1		
Total periods required:		**1**		**1**
UNIT-IV: FOURIER SERIES AND FOURIER TRANSFORMS				
36	Fourier series of functions in (0, 2 n),(- n , n) by Euler's formulae	1	T 1	
37	Fourier series of functions in (0, 2ℓ) ,(- ℓ , ℓ) by Euler's formulae	1	T 1	
38	Fourier series of Even and odd functions	1	T 1	
39	Tutorial	1		
40	Fourier series of periodic function	1		
41	Half – range Fourier sine and cosine expansions.	2	T 1	
42	Tutorial	1	T 1	
43	Fourier integral theorem (Statement only). Fourier sine and cosine integrals	1		
42	Formative test - Fourier sine and cosine transforms	2	T 1	
43	Tutorial	1		
Total periods required:		**1**		**2**
UNIT-V: PARTIAL DIFFERENTIAL EQUATIONS				
44	Formation of partial differential equations	1	T 1	
45	Solutions of second order PDE by Method of separation of variables	2	T 1	
46	Tutorial	1		
47	Solutions of one dimensional wave equation	3	T 1	
48	Tutorial	1		

49	Formative test - Solutions of one dimensional Heat equations	3	T 1	
50	Tutorial	1		
Total periods required:		**1**		**2**
Grand total periods required:		**6**		**0**

TEXT BOOKS:

T1. T.K.V. Iyengar, B. Krishna Gandhi ..etal.,Mathematical Methods, S. Chand&Company, 8/e (2013).

REFERENCE BOOKS:

R1. B.S.Grewal, Higher Engineering Mathematics, Khanna publishers, Delhi, 42/e, 2012.

R2. S.S.Sastry, Introductory methods of Numerical Analysis, Prentice hall of India, 4/e,2005

Signature of the faculty Signature of the HOD