SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY

COURSE PLAN (THEORY)

ACADEMIC YEAR: 2018-2019(even)

Subject Code	MA8491		L	P	T	C
Subject Title	NUMERICAL METHODS		4	0	0	4
Year / Dept / Sem	II/ CIVIL/ IV	Regulation Year	2017			
Faculty Name / Desg / Dept	MRS.P.SURIYAKALA, AP/ MATHEMATICS					
Course Prerequisite	DIFFERENTIATION AND INTEGRATION					
Attach the copy of syllabus						
Course Objectives (CO)	CO1: Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems. CO2: Apply numerical methods to obtain approximate solutions to mathematical problems. CO3:. Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations. CO4: Analyse and evaluate the accuracy of common numerical methods. CO5: Implement numerical methods in Matlab. CO6: Write efficient, well-documented Matlab code and present numerical results in an informative way.					
Expected Course Outcomes (ECO)	At the end of the course, the students should be able to: ECO1: Know about numerical differentiation ECO2:Ability to solve the numerical differentiation problems ECO3:To understand the concept of numerical integration and solve it. ECO4:To understand the concept of numerical double integration and able to solve them					

Mapping of CO & PO(Specify the PO's) - *(Fill the col.s with the legend given below)*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	B,3					A,1				D,2		
CO2		B,2				C,3						D,1
CO3		D,1			E,2				H,3			
CO4				B,3		C,2				D,1		
CO5		B,2			D,1				E,3			
CO6						B,3				D,1		C,2

Bridging the Curriculum Gap (Additional Topics beyond syllabus/Seminars/Assignments)	BCG1: Advanced Numerical Methods and Their Applications to Industrial Problems-Adaptive Finite Element Methods BCG2:Numerical Analysis BCG3:Assignment In interpolation problems

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Related Website URLs	W1:https://mat.iitm.ac.in/home/sryedida/public_html/caimna/interpolation/wop.html W2: https://en.wikipedia.org/wiki/Numerical_integration W3: http://www.ece.mcmaster.ca/~xwu/part6.pdf W4: http://caig.cs.nctu.edu.tw/course/NM07S/slides/chap5_3.pdf W5:https://mat.iitm.ac.in/home/sryedida/public_html/caimna/interpolation/nfdf.html
Related Video Course Materials (min. 3 no.s)	V1: https://www.youtube.com/watch?v=ŏE7zPlaO8Jo V2: https://www.youtube.com/watch?v=qVmB3hmcFQs V3: https://www.youtube.com/watch?v=_zK_KhHW6og V4: https://www.youtube.com/watch?v=RTX-ik_8i-k V5: http://www.math.uni-bremen.de/~schmidt/SS04/YSU_Notes.pdf

S.no.	Topic Name	Reference Book	Page no.	Teaching Aids	No.of Periods	Cumulative Periods
UNIT I SOLUTION OF EQUATIONS AND EIGEN VALUES PROBLEMS						
1.	Introduction	T3	1.1	Chalk and Talk	1	1
2.	Newtons Raphson method	T3	1.14-1.41	Black Board	3	4
3.	Fixed point iteration method	T3	1.3-1.11	Black Board	1	5
4.	Gauss elimination method	T3	1.48-1.50	Black Board	1	6
5.	Gauss Jordon method	T3	1.50-1.59	Black Board	1	7
6.	Gauss seidal method	T3	1.66-1.79	Black Board	1	8
7.	Inverse of a matrix by gauss Jordon matrix	T3	1.89-1.92	Black Board	1	9
8.	Eigen value of a matrix by power method	T3	1.95-1.103	Black Board	2	11
9.	Eigen values of a symmetric matrix by Jacobi method	T3	1.87-1.88	Black Board	1	12
10.	Review & unit test				1	13
UNIT II INTERPOLATION AND APPROXIMATION						
11.	Lagrangian polynomial	T3	2.2-2.22	Black board	3	16
12.	Divided differences	T3	2.30-2.42	Black Board	2	18
13.	Interpolating with a cubic	T3	2.47-2.72	Black	4	22

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	spline			Board		
14.	Newton's forward interpolation	T3	2.77-2.79	Black Board	1	23
15.	Newton's backward interpolation	T3	2.79-2.102	Black Board	1	24
16.	Review & unit test			Black Board	1	25
UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION						
17.	Differentiation using interpolation formulae	T3	3.2-3.29	Black Board	5	30
18.	Trapezoidal rule	T3	3.37-3.3.53	Black Board	1	31
19.	Simpon's 1/3-rule	T3	3.37-3.53	Black Board	1	32
20.	Simpon's 3/8 -rule	T3	3.37-3.53	Black Board	1	33
21.	Romberg method	T3	3.54-3.60	Black Board	1	34
22.	Gaussian quadrature formulae	T3	3.72-3.92	Black Board	2	36
23.	Double integration using trapezoidal rule	T3	3.96-3.98	Black Board	1	37
24.	Simpon's rule	T3	3.98-3.113	Black Board	1	38
25.	Review & Unit test				1	39
UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS.						
26.	Taylor series method	T3	4.3-4.19	Black Board	2	41
27.	Euler method	T3	4.24-4.33	Black Board	1	42
28.	Modified Euler method	T3	4.24-4.33	Black Board	1	43
29.	Fourth order runge-kutta method for solving first order equations	T3	4.36-4.44	Black Board	2	45
30.	Fourth order runge-kutta method for solving second order equations	T3	4.45-4.58	Black Board	2	47
31.	Milne's predictor & corrector method	T3	4.63-4.87	Black Board	2	49
32.	Adam's predictor & corrector method	T3	4.91-4.100	Black Board	2	51
33	Review & unit test			Black Board	1	52

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UNIT V BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS						
34.	Finite difference solution of second order ordinary differential equation	T3	5.1-5.15	Black Board	2	54
35.	Finite different solution of the dimensional heat equation by explicit method	T3	5.109-5.116	Black Board	2	56
36.	Implicit method	T3	5.117-5.126	Black Board	2	58
37.	One dimensional wave equation	T3	5.137-5.142	Black Board	2	60
38.	Two dimensional laplace equation	T3	5.142-5.146	Black Board	2	62
39	Poisson equation	T3	5.90-5.107	Black Board	2	64
40.	Review & unit test			Black Board	1	65

	Prepared by	Approved by
Signature	P. Suriya	P. Suriya
Name	Mrs.P.SURIYAKALA	Mrs.P.SURIYAKALA
Designation	Assistant Professor /S&H	SECTION HEAD
Signed date	23/10/18	23/10/18

|Endorsed|

|Prd|

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