SKILL BASED SUBJECT -III NUMERICAL METHODS

Semester	Subject Code	Category	Lecture		Theory		Practical	Credit
V		Skill	Hrs/Week	Hrs/Sem	Hrs/week	Hrs/Sem	0	2
		based subject- III	2	30	2	30		

COURSE OBJECTIVES:

The students will be able to

- Understand the basic methods for forming difference table and learn the essence of interpolation techniques
- Solve algebraic equations, system of linear equations and to find numerical differentiation, numerical integration and numerical solution of ordinary differential equations.

COURSE OUTCOMES:

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level (K1-K4)
C01	Find the solution of algebraic and transcendental equation using different methods	K2
CO2	Understand and apply the concepts of finite differences	K3
CO3	Calculate numerical differentiation and integration	K3
CO4	Evaluate the problems on linear systems	K3
CO5	Acquire the knowledge of numerical Solution of ordinary differential equations	K3

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

MAPPING WITH PROGRAMME OUTCOMES:

Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	М	М	S	S	М
CO2	S	М	S	S	S	S
CO3	S	М	М	М	S	М
CO4	S	М	S	S	М	S
CO5	S	М	S	S	М	М

S- Strong: M- Medium: L- Low

UNIT I: SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATION 6 Hours

Solution of Algebraic and Transcendental equation - Iteration Method, Method of False position, Newton Raphson Method – Simple Problems.

(Section SE.4 – SE.36)

UNIT II: FINITE DIFFERENCES

Finite differences-Forward differences, Backward difference, Newton's formula for interpolation. Lagrange's interpolation formula - Simple Problems.

(Section IA – IA.4, IA.31 to IA.34)

UNIT III- NUMERICAL DIFFERENTIATION AND INTEGRATION 6 Hours

Numerical differentiation and integration – Numerical differentiation- Errors in Numerical Differentiation-Differentiation Formulae with function values, Numerical integration - Trapezoidal Rule and Simpson's Rule - Simple Problems.

(Section D1.1- D1.6, D1.20-D1.24)

UNIT IV - SOLUTION OF LINEAR SYSTEMS

Solution of linear Systems – Direct Methods –Gaussian Elimination method, Gauss Jordan method - Simple Problems.

(Section SE. 42-SE.44)

UNIT V- NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS 6 Hours

Numerical Solution of ordinary differential equations – Solution by Taylor Series, Picard's method of Successive approximations, Euler method, Runge- Kutta method (Only D.E. of II Order) - Simple Problems.

(Section OD.1- OD.22, OD.31, OD: 45-61)

TEXT BOOK

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF
				PUBLICATION
1.	S.Kalavathy	Numerical Methods	Vijay Nicole	2010
	and M.Joice		Imprints Private	
	Punitha		Limited, Chennai	

6 Hours

6 Hours

REFERENCE BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF
				PUBLICATION
1	M.K Jain, S.R.K	Numerical Methods for	New age	2012
	Iyengar, and R.K	Scientific and	International	
	Jain	Engineering	Publisher, India	
		Computation		
2.	E. Balagurusamy	Numerical Methods	Tata McGraw	2004
			Hill Publishing	
			Company, New	
			Delhi	
3.	P.Kandasamy,	Numerical Methods	S.Chand&	1997
	K.Thilagavathi,		Company Ltd,	
	K.Gunavathi		New Delhi	
4.	A.Singaravelu	Numerical Methods	Meenakshi	2002
			Publications,	
			Chennai	

WEB RESOURCES

- 1. http://nptel.ac.in/courses/122102009/,
- 2. http://www.math.ust.hk/~machas/numerical-methods.pdf

TEACHING METHODOLOGY

- 1. Class room Teaching
- 2. Assignments
- 3. Seminars
- 4. Discussions
- 5. PPT Presentations