

with effect from :2019-20 (R-19)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MATHEMATICS
NUMERICAL METHODS
(Open Elective)
For B.E., V - Semester – CBCS
(for CSE & IT only)

Name of the Faculty: Mr.M.Venkateshwar .Rao

Instruction : 3 Hours per week	Sem. End Exam Marks : 60	Subject Reference Code : U19OE510MA
Credits : 3	Sessional Marks : 40	Duration of Semester End Exam : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<i>The course will enable the students to:</i>	<i>At the end of the course students will be able to:</i>
<ol style="list-style-type: none">1. Study various numerical methods to solve Algebraic and Transcendental equations.2. Understand the methods to solve algebraic equations.3. Understand the numerical methods in interpolation and extrapolation.4. Understand numerical solutions of ordinary differential equations.5. Understand various numerical methods for evaluation of definite and double integrals.	<ol style="list-style-type: none">1. Apply numerical methods to solve Algebraic and Transcendental equations which cannot be solved by traditional algebraic methods2. Solve simultaneous algebraic equations using direct and iteration methods.3. Use various numerical methods in interpolation and extrapolation.4. Find numerical solutions of ordinary differential equations.5. Apply various numerical methods for evaluation of definite and double integrals.

Unit – I: (8 Hours)

Solution of Algebraic and Transcendental equations:

Errors in computation-Types of errors- Useful rules for estimating errors- Intermediate value property of equations-Solution of Algebraic and Transcendental equations: Bisection method, Newton-Raphson method Regula-Falsi method.

Unit – II: (8 Hours)

Solution of linear system of equations:

Direct methods- Gauss elimination method- Factorization method- Iterative methods: Jacobi's Iteration method- Gauss - Seidel Iteration method-III-conditioned system of equations.

Unit – III: (8 Hours)

Numerical differences

Introduction to finite differences -Central differences interpolation-Gauss's forwards and backward difference formulae-Stirling's formula- Bessel's formula.

Unit – IV: (8 Hours)

Numerical Integration

Introduction to Numerical Integration - Boole's Rule – Weddle's Rule – Evaluation of Double Integrals using Numerical Methods – Trapezoidal Rule – Simpson's Rule.

Unit – V: (8 Hours)

Numerical Solutions of Ordinary Differential Equations

Numerical Solutions of Ordinary Differential Equations: Euler's Method - Modified Euler's Method – Predictor–Corrector methods- Milne's method –Adam's Bashforth method.

Text Books:

1. Numerical methods in engineering and science by B.S.Grewal, Khanna publishers
2. Advanced Engineering Mathematics by R.K.Jain & S.R.K.Iyengar, Narosa publishing house.

Reference Books:

1. Numerical Analysis by S.S.Sastry, PHI Ltd.

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