

JAWAHARLAL NEHRUTECHNOLOGICALUNIVERSITY:KAKINADA KAKINADA-533003,AndhraPradesh,India

R-16 Syllabus for CSE.JNTUK

I Year-I Semester	L	T	P	С
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MATHEMATICS-II (Mathematical Methods) (R161109)

Prerequisite Course: Operation of Scientific Calculator

Course Description and Objectives:

- 1. The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
- 2. The skills derived from the course will help the student from a necessary base to develop analytic and design concepts.
- 3. Understand the most basic numerical methods to solve simultaneous linear equations.

Course Outcomes:

Upon completion of the course, the student will be able to achieve the following outcomes.

CO	Course Outcomes	POs
1	Calculate a root of an algebraic and transcendental equations.	4
2	Establish the relation between the finite difference operators. Compute	5
	interpolating polynomial for the given data.	
3	Solve ordinary differential equations numerically using Euler's and RK method.	5
4	Find Fourier series for certain functions.	4
5	Find Fourier transforms for certain functions.	4
6	Apply method of seperation of variables in one dimensional wave and heat equations and two dimensional Laplace equation.	5

Syllabus:

UNIT I:

Solution of Algebraic and Transcendental Equations:

Introduction- Bisection method – Method of false position – Iteration method – Newton-Raphson method (One variable and simultaneous Equations).

UNIT II:

Interpolation:

Introduction- Errors in polynomial interpolation – Finite differences- Forward differences-Backward differences – Central differences – Symbolic relations and separation of symbols - Differences of a polynomial-Newton's formulae for interpolation – Interpolation with unequal intervals - Lagrange's interpolation formula.

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UNIT III:

Numerical Integration and solution of Ordinary Differential equations:

Trapezoidal rule- Simpson's 1/3rd and 3/8th rule-Solution of ordinary differential equations by Taylor's series-Picard's method of successive approximations-Euler's method - Runge-Kutta method (second and fourth order).

UNIT IV:

Fourier Series:

Introduction- Periodic functions – Fourier series of -periodic function - Dirichlet's conditions – Even and odd functions – Change of interval – Half-range sine and cosine series.

UNIT V:

Applications of PDE:

Method of separation of Variables- Solution of One dimensional Wave, Heat and two-dimensional Laplace equation.

UNIT VI:

Fourier Transforms:

Fourier integral theorem (without proof) – Fourier sine and cosine integrals - sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

TEXT BOOKS:

- 1. B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
- 2. N.P.Bali, Engineering Mathematics, Lakshmi Publications.

REFERENCE BOOKS:

- 1. Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press
- 2. V.Ravindranath and P.Vijayalakshmi, Mathematical Methods, Himalaya Publishing House.
- 3. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India
- 4. David Kincaid, Ward Cheney, Numerical Analysis-Mathematics of Scientific Computing, 3rd Edition, Universities Press.
- 5. Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.
- 6. Dass H.K., Rajnish Verma. Er., Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi.