

Year & Sem: E1S1	Course Code: MA1101	Course Name: Engineering Mathematics-I	No. of Credits: 4	L 2	T&PS 2	P 0
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UNIT -I: Sequences and Series:

Sequences and their limits, Convergence of series, Comparison test, Ratio test, Root test, Absolute and Conditional convergence, Alternating series, Power series, Taylor's and Maclaurin's series

UNIT – II: Functions of several variables

Limit, Continuity and Differentiability of functions of several variables, Partial derivatives and their geometrical interpretation, Differentials, Derivatives of Composite and Implicit functions, Derivatives of higher order and their commutativity, Euler's theorem on homogeneous functions, Harmonic functions

UNIT – III: Applications of functions of several variables

Taylor's expansion of functions of several variables, Maxima and Minima of functions of several variables - Lagrange's method of multipliers.

UNIT – IV: Numerical Methods and numerical integration

Roots of polynomial and transcendental equations - bisection, Newton-Raphson and regula-falsi methods. Trapezoidal and Simpson's 1/3rd rule for numerical integration.

UNIT – V: Interpolation

Finite differences, Newton's forward and backward interpolation formulae, central difference interpolation formulae

UNIT-VI: PDE

Introduction, formation of PDE, Lagrange's equation, Nonlinear first order equation, Higher order linear equation with constant coefficients.

Text Books:

Advanced Engineering Mathematics (3rd Edition) by R. K. Jain and S. R. K. Iyengar, Narosa Publishing House, New Delhi.

Reference Books:

Advanced Engineering Mathematics (8th Edition) by Erwin Kreyszig, Wiley-India. 2. Complex variables and Applications (8th Edition), by J.W. Brown and R.V. Churchill, McGraw - Hill 2

Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.

Video Lectures (Web Links):

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- 2.
- 3.