Course Type	Course Code	Name of Course	L	T	P	Credit
IDC1	NMCI101	Engineering Mathematics-I	3	0	0	3

Course Objective
The objective of the course is to present an introduction to basic concepts of calculus of one variable and several variables and analytical geometry.
Learning Outcomes
Upon successful completion of this course, students will: • have a broad understanding of calculus of one and several variables. • be able to use the techniques of integrations for solving variety of problems arising in science and engineering. • learn and use the vector calculus and analytical geometry in multiple dimensions.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Taylor's theorem and Taylor Series, Maclaurin series	4	Students will be able to understand the calculus of several variables
	Functions of several variables, Limit and continuity, Partial and total derivatives	4	
	Jacobian, Chain rule, Taylor's theorem of several variables	4	
	Maxima and minima, Method of Lagrange multipliers	3	
2	Improper integral of first and second kind, Convergence of improper integrals	4	This unit will help students to understand the basic idea of improper integrals and their convergence.
	Beta and gamma functions	3	
3	Double and triple integration, Change of order, Change of variables	5	This unit will help students to apply the ideas of double and triple integrals to solve problems of practical nature.
	Applications of double and triple integration such as area, volume, mass, centre of gravity, moment of inertia	4	
4	Parameterization of curves and surfaces, Vector fields, Gradient, Directional derivatives, Divergence and curl	4	Students will be able to understand the vector calculus and its applications to solve a variety of problems arising in engineering and sciences.
	Line integrals, Green's theorem, Surface integral, Volume integral	4	
	Gauss and Stokes' theorems with applications	3	

Text Books:

1. G. B. Thomas and R. L. Finney, Calculus and Analytic Geometry (9th Edition), ISE Reprint, AddisonWesley, 2010.

Reference Books:

1. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics (5th Edition), Narosa (2018).
2. T. M. Apostol, Calculus, Volumes 1 and 2 (2nd Edition), Wiley Eastern 1980.

Evaluation Plan:

1. There will be two quizzes. Each quiz will be of 30 minutes duration and will carry 10% weightage. The two quizzes will be held at NLHC as per following schedule:

	Date	Time
Quiz 1	10.09.2025	6:15 PM-6:45 PM
Quiz 2	11.11.2025	6:15 PM-6:45 PM

2. The Mid-Semester Examination, scheduled to be held during September 16-21, 2025 will be of 30% weightage
3. The End-Semester Examination, scheduled to be held during November 19-30, 2025 will be of 50% weightage.