SEMESTER- VII

MIC-09: Multivariate Calculus

Course Outcomes

After the completion of the course, the student will be able to understand:

CO1: The conceptual variations when advancing in calculus from one variable to multivariable discussions.

CO2: Inter-relationship amongst the line integral, double and triple integral formulations.

CO3: Applications of multi variable calculus tools in different disciplines.

Unit	Topics to be covered	No. of Lectures
MIC-09 : Multivariate Calculus (4 credits) Full Marks-100		
1	Functions of several variables, Limits and continuity, Partial derivatives, Higher order partial derivatives, Euler's theorem on Homogeneous function	10
2	Double integrals in Cartesian and polar co-ordinates, Triple integrals, Change of variables in double and triple integrals.	10
3	Line integrals, Applications of line integrals: Mass and Work, Fundamental theorem for line integrals, Definition of vector field, Conservative vector fields, Divergence and curl.	10
4	Green's theorem- Tangential and Normal form, Evaluate line integrals using Green's theorem, Surface integrals, Stokes' theorem.	10
	TOTAL	40

Book References:

1. Malik, S.C. & Arora, Savita (2017). Mathematical Analysis, New Age International Private Limited.
2. Marsden, J. E., Tromba, A., & Weinstein, A. (2004). Basic Multivariable Calculus. Springer (SIE). First Indian Reprint.
3. Thomas' Calculus, 14e Paperback, George B. Thomas, Joel Hass, Christopher Heil, Maurice D. Weir, Pearson Education.
4. Prasad Lalji, Advanced Calculus, Paramount Publications, Revised Edition (2015).