

MTH316 Multivariable Calculus

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JAN

Synopsis:

MTH316 Multivariable Calculus will introduce students to the Calculus of functions of several variables. Students will be exposed to computational techniques in evaluating limits and partial derivatives, multiple integrals as well as evaluating line and surface integrals using Green's theorem, Stokes' theorem and Divergence theorem. Applications of Lagrange multipliers to optimization and applications of integration such as dynamics, electromagnetism and thermodynamics will also be emphasized.

Topics:

- Limits and Continuity
- Partial differentiation
- Differentiable functions
- Chain Rule
- Taylor's formula
- Lagrange multipliers
- Multiple integrals
- Change of order of integration
- Jacobian matrix
- Change of variables in multiple integrals
- Line integrals
- Surface integrals

Textbooks:

James Stewart: Calculus: Early Transcendentals. International Metric Edition, 9th Cengage
ISBN-13: 9780357439197

Learning Outcome:

- Show that a given multivariable function is continuous/discontinuous or differentiable/not differentiable at specific points.
- Apply Lagrange multipliers and/or derivative test to find relative extremum of multivariable functions.
- Calculate the gradient or directional derivative of a multivariable function in a given direction.
- Determine the existence of limits of multivariable functions and value of these limits if they exist.
- Use Green's Theorem, Divergence Theorem or Stoke's Theorem for given line integrals and/or surface integrals.
- Compute multiple integrals or integrals of vector valued functions of several variables.

Assessment Strategies (Evening Class):

Components	Description	Weightage Allocation (%)
Overall Continuous Assessment	COMPUTER MARKED ASSIGNMENT 1	10
	TUTOR-MARKED ASSIGNMENT 1	20
Overall Examinable Components	Written Exam	70
Total		100