

Unit 1: One variable Calculus



6 Topics

Introduction to One Variable Calculus, Limits and Standard Limits

Continuity and Differentiability of Single Variable Functions

Successive Differentiation of Standard Functions

Rolle's Theorem and Applications

Lagrange's Mean Value Theorem and Applications

Taylor's Theorem for One Variable Functions and Numerical Applications

Unit 2: Two variable Calcus



6 Topics

Functions of Two Variables, Limits and Continuity

Partial Derivatives and Higher Order Partial Derivatives

Total Derivative and Chain Rule

Euler's Theorem for Homogeneous Functions

Taylor Series for Functions of Two Variables

Maclaurin Series for Functions of Two Variables

Unit 3: Application of Differential Calculus



7 Topics

Maxima and Minima of Functions of Two Variables

Hessian Matrix and Second Derivative Test

Lagrange's Method of Multipliers

Gradient Vector and Its Geometrical Interpretation

Gradient Descent Algorithm

Newton's Method for Optimization

Simple and Multiple Linear Regression through Optimization

Unit 4: Integral Calculus



4 Topics

Introduction to Multiple Integrals and Double Integrals

Triple Integrals and Applications

Change of Order of Integration

Change of Variables (Jacobian) and Applications to Area and Volume

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Unit 5: Vector Calculus

7 Topics



Equations of a Line and a Plane

Tangent Plane and Normal Line

Gradient and Directional Derivatives

Directional Derivatives

Divergence, Curl and Their Physical Significance

Line Integrals

Surface Integrals

Unit 999: Custom Unit

5 Topics



introduction

introduction

Zero Lecture

Zero Lecture

functions of single variable