ADVANCED CALCULUS II

Code: MATH 2209

2st stage

Assistant Lecturer: Nabaa Hussain Fakhry

Reference: Thomas' Calculus Early Transcendental Thirteenth Edition.

Chapter 14 – Partial Derivatives

14.1 Functions of Several Variables

14.2 Limits and Continuity in Higher Dimensions

14.3 Partial Derivatives

14.4 The Chain Rule

14.5 Directional Derivatives and Gradient Vectors

14.6 Tangent Planes and Differentials

14.7 Extreme Values and Saddle Points

14.8 Lagrange Multipliers

14.9 Taylor's Formula for Two Variables

Chapter 15 – Multiple Integrals

15.1 Double and Iterated Integrals over Rectangles

15.2 Double Integrals over General Regions

15.3 Area by Double Integration

15.4 Double Integrals in Polar Form

15.5 Triple Integrals in Rectangular Coordinates

15.6 Moments and Centers of Mass

15.7 Triple Integrals in Cylindrical and Spherical Coordinates

Chapter 16– Integrals and Vector Fields

16.1 Line Integrals
16.2 Vector Fields and Line Integrals: Work, Circulation, and Flux
16.3 Path Independence, Conservative Fields, and Potential Functions
16.4 Green's Theorem in the Plane
16.5 Surfaces and Area
16.6 Surface Integrals
16.7 Stokes' Theorem
16.8 The Divergence Theorem and a Unified Theory