

**Textbook:** Stewart: Calculus: Early Transcendentals, 9th Edition, Cengage.

**Prerequisite Course:** MAT 1505 Calculus II

## **Chapter 12: Vectors and the Geometry of Space**

- 12.1 Three Dimensional Coordinate Systems
- 12.2 Vectors
- 12.3 The Dot Product
- 12.4 Cross Products
- 10.1 Curves Defined by Parametric Equations - Review
- 12.5 Equations of Lines and Planes
- 12.6 Quadratic Surfaces (Optional)

## **Chapter 13: Vector Functions**

- 13.1 Vector Functions and Space Curves
- 13.2 Derivatives and Integrals of Vector Functions
- 13.3 Arc Length and Curvature
- 13.4 Motion in Space: Velocity and Acceleration

## **Chapter 14: Partial Derivatives**

- 14.1 Functions of Several Variables
- 14.2 Limits and Continuity
- 14.3 Partial Derivatives
- 14.4 Tangent Planes and Linear Approximations
- 14.5 The Chain Rule
- 14.6 Directional Derivatives and the Gradient
- 14.7 Maximum and Minimum Values
- 14.8 Lagrange Multipliers (Optional)

## **Chapter 15: Multiple Integrals**

- 15.1 Double Integrals over Rectangles
- 15.2 Double Integrals over General Regions

- 10.3 Polar Coordinates - Review
- 15.3 Double Integrals in Polar Coordinates
- 15.4 Applications of Double Integrals
- 15.5 Surface Area (Optional)
- 15.6 Triple Integrals
- 15.7 Triple Integrals in Cylindrical Coordinates
- 15.8 Triple Integrals in Spherical Coordinates (Optional)

## **Chapter 16: Vector Calculus**

- 16.1 Vector Fields
- 16.2 Line Integrals
- 16.3 Fundamental Theorem for Line Integrals
- 16.4 Green's Theorem
- 16.5 Curl and Divergence
- 16.6 Parametric Surfaces & Their Areas (Optional)
- 16.7 Surface Integrals (Optional)
- 16.8 Stokes' Theorem (Optional)
- 16.9 The Divergence Theorem (Optional)

This material is covered over a 14 week (56 class hours) semester.