



**I. COURSE DESCRIPTION:**

A modern, unified course in analytic geometry and calculus including integration techniques, L'Hopital's Rule, infinite series, power series, conics, parametric equations, and vectors.

**II. PREREQUISITES:**

MTH 173 – Calculus with Analytic Geometry I.

**III. INTRODUCTION:**

This course is designed to serve as an introduction to analytic geometry and calculus for students majoring in mathematics, engineering, computer science, and science.

**IV. INSTRUCTIONAL MATERIALS:**

Textbook: Calculus, Ninth Edition, by Larson, and Edwards;  
Cengage Learning, 2010; ISBN – 10:0547167024/  
ISBN – 13:9780547167022 **REQUIRED**

Graphing or scientific calculator **REQUIRED**

Study and Solutions Guide, Volume I, ISBN - 10:0547213093/ISBN -  
13:9780547213095 and Volume II, ISBN – 10:0547213107/ISBN – 13:9780547213101,  
by Bruce H. Edwards. **OPTIONAL**

**V. MATERIAL TO BE COVERED:**

Unit I	Chapter 8	4 weeks
Unit II	Chapter 9	5 weeks
Unit III	Chapter 10	3.5 weeks
Unit IV	Sections 11.1-11.4	2.5 weeks

**VI. BASIC CONCEPTS:****Unit I – Integration Techniques, L'Hôpital's Rule, and Improper Integrals**

- 8.1 Basic integration rules
- 8.2 Integration by parts
- 8.3 Trigonometric integrals
- 8.4 Trigonometric substitution
- 8.5 Partial fractions
- 8.6 Integration by tables and other integration techniques
- 8.7 Indeterminate forms and L'Hôpital's rule
- 8.8 Improper integrals

## **Unit II – Infinite Series**

- 9.1 Sequences
- 9.2 Series and convergence
- 9.3 The integral test and  $p$ -series
- 9.4 Comparisons of series
- 9.5 Alternating series
- 9.6 The ratio and root tests
- 9.7 Taylor polynomials and approximations
- 9.8 Power series
- 9.9 Representation of functions by power series
- 9.10 Taylor and Maclaurin series

## **Unit III – Conics, Parametric Equations, and Polar Coordinates**

- 10.1 Conics and calculus
- 10.2 Plane curves and parametric equations
- 10.3 Parametric equations and calculus
- 10.4 Polar coordinates and polar graphs
- 10.5 Area and arc length in polar coordinates
- 10.6 Polar equations of conics and Kepler's laws

## **Unit IV – Vectors and the Geometry of Space**

- 11.1 Vectors in the plane
- 11.2 Space coordinates and vectors in space
- 11.3 The dot product of two vectors
- 11.4 The cross product of two vectors in space

## **VII. SUGGESTED WEEKLY SCHEDULE – 16 WEEK SEMESTER:**

- Week 1: 8.1, 8.2
  - Week 2: 8.3, 8.4
  - Week 3: 8.5, 8.6
  - Week 4: 8.7, 8.8
  - Week 5: Test 1, 9.1, 9.2
  - Week 6: 9.3, 9.4
  - Week 7: 9.5, 9.6
  - Week 8: 9.7
  - Week 9: 9.8, 9.9
  - Week 10: 9.10, Test 2, 10.1
  - Week 11: 10.2, 10.3
  - Week 12: 10.4, 10.5
  - Week 13: 10.6, Test 3, 11.1
  - Week 14: 11.2, 11.3
  - Week 15: 11.4, Test 4
- Final Exam to be given during scheduled exam period.

### **VIII. SUGGESTED WEEKLY SCHEDULE – 10 WEEK SEMESTER:**

Week 1:	8.1, 8.2, 8.3
Week 2:	8.4, 8.5, 8.6
Week 3:	8.7, 8.8, Test 1, 9.1
Week 4:	9.2, 9.3, 9.4
Week 5:	9.5, 9.6, 9.7
Week 6:	9.8, 9.9, 9.10, Test 2
Week 7:	10.1, 10.2, 10.3
Week 8:	10.4, 10.5, 10.6, Test 3
Week 9:	11.1, 11.2, 11.3
Week 10:	11.4, Test 4, Final Exam

### **IX. ADDITIONAL MATERIAL AVAILABLE TO STUDENTS:**

TCC Student ID Required to Use the First 2 Resources

1. Complete Solutions Guide, Available in the Math Lab
2. Calculus, 9E, DVDs, lectures corresponding to the text by section, Available in the Learning Resources Center
3. Website ([college.hmco.com](http://college.hmco.com))