

**Departmental Syllabus**  
**Math 2740 -- Calculus and Analytic Geometry II**

**Textbook:** Single Variable Calculus (Sixth Edition), by James Stewart

**Prerequisites:** MATH 2640 with a grade of "C" or better, or a score of 4 or 5 on the Advanced Placement Calculus AB examination, or a score of 3 on the Advanced Placement Calculus BC examination.

**Calculators:** Graphing calculator required; TI-83, 84, 85 or 86 recommended.  
(NOTE: On occasion, individual instructors may restrict the use of any type of calculator).

**Course Description:** Derivatives and integrals involving exponential, logarithmic, and inverse trigonometric functions, further study of limits, further techniques and applications of integration, sequences and series, polar coordinates, and parametric equations.

**Topics and sections to be covered:**

**Chapter 7 – Inverse Functions**

- 7.1 Inverse Functions
- 7.2 Exponential Functions and Their Derivatives  
(or 7.2\* -- The Natural Logarithmic Function)
- 7.3 Logarithmic Functions  
(or 7.3\* -- The Natural Exponential Function)
- 7.4 Derivatives of Logarithmic Functions  
(or 7.4\* -- General Logarithmic and Exponential Functions)
- 7.5 Exponential Growth and Decay
- 7.6 Inverse Trigonometric Functions
- 7.8 Indeterminate Forms and L'Hospital's Rule

**Chapter 8 – Techniques of Integration**

- 8.1 Integration by Parts
- 8.2 Trigonometric Integrals
- 8.3 Trigonometric Substitution
- 8.4 Integration of Rational Functions by Partial Fractions
- 8.5 Strategy for Integration (review purposes only)
- 8.6 Integration Using Tables (optional)
- 8.7 Approximate Integration
- 8.8 Improper Integrals

**Chapter 12 – Infinite Sequences and Series**

- 12.1 Sequences

- 12.2 Series
- 12.3 The Integral Test and Estimates of Sums
- 12.4 The Comparison Tests
- 12.5 Alternating Series
- 12.6 Absolute Convergence and the Ratio and Root Tests
- 12.7 Strategy for Testing Series (review purposes only)
- 12.8 Power Series
- 12.9 Representations of Functions as Power Series
- 12.10 Taylor and Maclaurin Series
- 12.11 Applications of Taylor Polynomials

### **Chapter 11 – Parametric Equations and Polar Coordinates**

- 11.1 Curves Defined by Parametric Equations
- 11.2 Calculus with Parametric Curves (including Section 9.1 -- Arc Length and Section 9.2 -- Area of a Surface of Revolution)
- 11.3 Polar Coordinates
- 11.4 Areas and Lengths in Polar Coordinates
- 11.5 Conic Sections (optional)
- 11.6 Conic Sections in Polar Coordinates (optional)