**Departmental Syllabus**  
**Math 2640 -- Calculus and Analytic Geometry I**

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

**Prerequisites:** MATH 2450 or MATH 2530 with a grade of "C-" or better, or mathematics proficiency level of 40.

**Calculators:** A scientific calculator (such as one of the TI-30 models) or a graphing calculator (such as the TI-83, 84, 85, 86 or the TI-Nspire with TI-84 keypad) is required. Calculators with Computer Algebra Systems (CAS), (e.g. the TI-89, TI-92 and TI-Nspire with CAS keypad, or their equivalent), are not allowed in any math classes. On occasion, individual instructors may restrict the use of any type of calculator.

**Course Description:** Limits and continuity, differentiation, differentials, antiderivatives, the definite integral and applications.

**Student Learning Outcomes:** Students should be able to:
- compute limits and derivatives;
- interpret limits and derivatives;
- apply derivatives to optimization problems;
- compute integrals of basic algebraic and trigonometric functions; and
- apply integration to area and volume calculations.

**General Education Learning Outcomes:** UW-Platteville students shall:
- 1-1 Recognize mathematical patterns to solve problems
- 1-2 Demonstrate ability to work with numbers, space and data
- 1-7 Demonstrate skills in problem-solving
- 1-9 Assess the plausibility of proposed solutions

**Topics and sections to be covered:**

(Chapter 1 consists of precalculus topics which most instructors will cover on an "as needed" basis throughout the course).

**Chapter 2 – Limits**
- 2.1 The Tangent and Velocity Problems
- 2.2 The Limit of a Function
- 2.3 Calculating Limits Using the Limit Laws
- 2.5 Continuity

**Chapter 3 – Derivatives**
- 3.1 Derivatives and Rates of Change
- 3.2 The Derivative as a Function
- 3.3 Differentiation Formulas
- 3.4 Derivatives of Trigonometric Functions
3.5 The Chain Rule
3.6 Implicit Differentiation
3.7 Rates of Change in the Natural and Social Sciences
3.8 Related Rates
3.9 Linear Approximations and Differentials

Chapter 4 – Applications of Differentiation
4.1 Maximum and Minimum Values
4.2 The Mean Value Theorem
4.3 How Derivatives Affect the Shape of a Graph
4.4 Limits at Infinity; Horizontal Asymptotes
4.5 Summary of Curve Sketching
4.6 Graphing with Calculus and Calculators (review purposes only)
4.7 Optimization Problems
4.8 Newton's Method
4.9 Antiderivatives

Appendix E
Sigma Notation

Chapter 5 -- Integrals
5.1 Areas and Distances
5.2 The Definite Integral
5.3 The Fundamental Theorem of Calculus
5.4 Indefinite Integrals and the Net Change Theorem
5.5 The Substitution Rule

Chapter 6 – Applications of Integration
6.1 Areas Between Curves
6.2 Volumes
6.3 Volumes by Cylindrical Shells
6.4 Work
6.5 Average Value of a Function (optional)

Chapter 9 – Further Applications of Integration
9.3 Applications to Physics and Engineering (Hydrostatic Force and Pressure)

If you require an accommodation due to a disability, please make an appointment to see me as soon as possible to discuss arrangements for the accommodations. You will need a Verified Individualized Services and Accommodations (VISA) form from Services for Students with Disabilities.