**Course Abbreviation & Number:** MATH 2432

**Course Title:** Calculus II

**Credit Hours:** 4 semester hours

**Prerequisites:**
- Math 2431 with grade of C or better

**Course Description:**
This course includes the study of techniques of integration, applications of the definite integral, an introduction to differential equations, polar graphs, and power series.

**Expected Educational Results:**
As a result of completing this course, the student will be able to:
1. Evaluate integrals using techniques of integration.
2. Approximate the definite integral using the Trapezoid Rule and Simpson’s Rule.
3. Use integrals to solve application problems.
4. Solve separable differential equations and apply to elementary applications.
5. Evaluate the convergence of series and apply series to approximate functions and definite integrals.
6. Apply polar representations including graphs, derivatives, and areas.

**Course Content:**

I.** Integrals
   A. The Definite Integral
   B. Evaluating Definite Integrals
   C. The Fundamental Theorem of Calculus
   D. The Substitution Rule
   E. Integration by Parts
   F. Additional Techniques of Integration
   G. Integration Using Tables and Computer Algebra Systems
   H. Approximate Integration
I. Improper Integrals
II. Applications of Integration
   A. More about Areas
   B. Volumes
   C. Volumes by Cylindrical Shells
   D. Arc Length
   E. Average Value of a Function
   F. Applications to Physics and Engineering
III. Differential Equations
   A. Modeling with Differential Equations
   B. Direction Fields and Euler’s Method
   C. Separable Equations
   D. Exponential Growth and Decay
   E. The Logistic Equation
IV. Polar Representations
   A. Curves in Polar Coordinates
   B. Areas and Length in Polar Coordinates
V. Infinite Sequences and Series
   A. Sequences
   B. Series
   C. The Integral and Comparison Tests
   D. Other Convergence Tests
   E. Power Series
   F. Representations of Functions as Power Series
   G. Taylor and Maclaurin Series
   H. Applications of Taylor Polynomials
VI. Optional Sections
   A. Applications to Integration
   B. Probability

**Assessment of Outcome Objectives**

**Course Grade:**

I. Course Grade
Grades from some combination of the following will be used to determine each student’s final course grade: class participation, homework assignments, tests, quizzes, projects, and exams. Exams/tests may be multiple choice, some combination of multiple choice and short answer or essay, or purely essay and/or short answer. Individual instructors may determine the relative weightings of each component in determining the grade for the course, and must state the weightings to be used in determining student grades in the course syllabus. A comprehensive final examination is required which must count at least one-fifth and no more than one-third of the course grade.
II. Departmental Assessment
   A. This course will be assessed in the spring semester on a yearly assessment cycle. Questions assessing student mastery of outcomes for this course will be included in the final exam for this course. Each instructor must include these questions in the final exam. Each instructor is responsible for reviewing and tabulating the results of these outcome assessment questions and transmitting them to the Calculus Curriculum Committee. Individual instructors should use feedback from assessment in their classes to review and evaluate their own teaching practices.
   B. The construction of the outcome assessment questions will be the responsibility of the college-wide Calculus Curriculum Committee.

III. Use of Assessment Findings:
The Calculus Curriculum Committee will meet in the summer term after the spring assessment to review the course and to evaluate the results. The review of the course outcome assessment findings will provide information on success in achieving the desired outcomes for this course on a college-wide basis. If fewer than 70% of the students receive at least 75% on questions measuring any particular educational outcome, the committee will examine teaching practices related to that outcome, the assessment instrument, and the desired learning outcomes to determine which, if any, of these need modifying. The committee will share its findings and recommendations with all faculty teaching this course, and may make changes to the desired educational outcomes, teaching practices, or assessment instrument as appropriate.

Last Revised: February 2013