

**COMMON COURSE OUTLINE: Course discipline/number/title: MATH 1128: Calculus II**

**A. CATALOG DESCRIPTION**

1. **Credits:** 5
2. **Hours/Week:** 5
3. **Prerequisites (Course discipline/number):** Successful completion of MATH 1127.
4. **Co-requisites (Course discipline/number):** None
5. **MnTC Goals (if any):** NA

This course is a Liberal Arts mathematics course with major topics including: Transcendental functions, inverse functions, differentiability and integrability techniques of integration, applications of integration, differential equations, parametric forms, infinite sequences and series including Taylor's series.

**B. DATE LAST REVISED (Month, year):** August, 2005

**C. OUTLINE OF MAJOR CONTENT AREAS:**

Major Topics-

1. Transcendental functions
2. Inverse functions
3. Techniques of integration
4. L'Hopital's rule and improper integrals
5. Series
6. Conic sections
7. Parametric equations

Optional topics-

1. Rotation of conics in Cartesian form

**D. LEARNING OUTCOMES (GENERAL):** The student will be able to:

1. Transcendental functions
  - a) Take derivatives of, integrals of, and use the exponential and logarithmic functions
2. Inverse functions
  - a) Take derivatives of, integrals of, and use functions and their inverses including the trigonometric, inverse trigonometric, hyperbolic, and inverse hyperbolic functions
3. Techniques of integration
  - a) Recognize and integrate forms using: integration by parts, trigonometric forms, trigonometric substitution, rational form in trigonometry, partial fractions with linear, quadratic and repeated factors, and other miscellaneous substitutions
4. L'Hopital's rule and improper integrals
  - a) Apply L'Hopital's rule to evaluate indeterminate forms of limits
  - b) Evaluate improper integrals
5. Series
  - a) Recognize common infinite series
  - b) Evaluate convergence/divergence of series
  - c) Derive Taylor/Maclaurin series for differentiable functions
6. Conic sections
  - a) Recognize and identify aspects of parabolas (vertex, focus, axis of symmetry, directrix), circles (center, radius), ellipses (center, major/minor axes foci, vertices), hyperbolas (center, vertices, foci, transverse axis, conjugate axis), with eccentricity
7. Parametric equations
  - a) Be familiar with parametric forms of equations: graphing, symmetries, area, arc length, surface area, tangents
  - b) Know how to identify polar forms of equations: graphing, symmetries, area, arc length, surface area, tangents

**E. LEARNING OUTCOMES (MNTC):** NA



**F. METHODS FOR EVALUATION OF STUDENT LEARNING:**

1. Tests over covered topics
2. Quizzes
3. Homework
4. Group assignments
5. Projects
6. Comprehensive final exam (The comprehensive final exam should include but not be limited to evaluating the skills listed above in Course Objectives)

**Grading:** A,B,C,D,F

**G. SPECIAL INFORMATION (if any):**

A graphics calculator is required. TI 83 is recommended.