

# North Hennepin Community College

## MATH 1222: Calculus II

### A. COURSE DESCRIPTION

Credits: 5

Lecture Hours/Week: \*.\*

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites:

This course requires any of these three prerequisites

A score of 3 on test Adv Placement Calculus AB

A score of 3 on test Adv Placement Calculus BC

MATH 1221 - Calculus I (Minimum grade: 1.67 GPA Equivalent)

Corequisites: None

MnTC Goals: Goal 04 - Mathematical/Logical Reasoning

This course continues the study of the definite and indefinite integrals and leads to a study of improper integrals and infinite series. Topics include advanced techniques of anti-differentiation, numerical integration techniques and error bounding, applications of the integral, improper integrals, an introduction to differential equations, infinite series, parametric equations, and polar coordinates.

Prerequisites: Successful completion of Math 1221 with grade of "C" or better

**B. COURSE EFFECTIVE DATES:** 08/27/1997 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. See Course Description and Course Outcomes

### D. LEARNING OUTCOMES (General)

1. Apply a variety of integration techniques, including u-substitution, integration by parts, trigonometric substitution, and partial fractions. (MnTC Goal 4: a, b, d; Goal 2: a, b, c); (ELO 1 and 2)
2. Use definite integrals to solve problems such as finding area, work, volume, arc length, fluid forces, and center of mass. (MnTC Goal 4: a, b, d; Goal 2: a, b, c, d); (ELO 1, 2, 4)
3. Determine convergence or divergence of an improper integral. (G4: a, b, d; G2: a, b); (ELO 1 and 2)
4. Approximate a definite integral using Simpson's Rule and/or the Trapezoid Rule. (G4: a, d; G2: a, b); (ELO 1, 2, 4)
5. Apply the definition of convergence to calculate the limit of a sequence or the sum of a convergent series. (G4: a, b, c, d; G2: a, b, d); (ELO 1 and 2)
6. Apply tests of convergence to determine the behavior of an infinite series. (G4: a, b, c, d; G2: a, b, d); (ELO 1 and 2)
7. Find Taylor series representations of basic functions. (G4: a, b, d; G2: a, b, c); (ELO 1 and 2)
8. Find the slope of a line tangent to a parametric curve. (G4: a, b, d; G2: a, b); (ELO 1 and 2)
9. Graph functions in polar coordinates and find slopes of tangent lines. (G4: a, b, d; G2: a, b); (ELO 1 and 2)

## **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

Goal 04 - Mathematical/Logical Reasoning

1. Illustrate historical and contemporary applications of mathematical/logical systems.
2. Clearly express mathematical/logical ideas in writing.
3. Apply higher-order problem-solving and/or modeling strategies.

## **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

## **G. SPECIAL INFORMATION**

1. Knowledge of Human Cultures and the Physical and Natural World--Through study in the sciences, mathematics, social sciences, humanities, histories, languages, the arts, technology and professions.
2. Intellectual and Practical Skills--Including: Inquiry and analysis; Critical and creative thinking; Written and oral communication; Quantitative literacy; Information literacy; Teamwork and problem solving.