NORTHWESTERN CONNECTICUT COMMUNITY COLLEGE

COURSE SYLLABUS

Course Title: Calculus II   **Course #: MAT 256**

The course will continue where a first semester calculus course ended. Topics include applications of integration, integration techniques, sequences and series, and differential and integral calculus applied to parametric and polar functions. Knowledge of this subject-matter is essential for those pursuing studies in the physical sciences, engineering, mathematics or a host of other fields. Students are assumed to have a good grasp of differentiation and some basic exposure to elementary integration.

The use of a graphing calculator is required in the course (TI-83 plus or TI-84 plus). 4 credits

Prerequisite: C or better in Calculus I (Mat 254).

Goals: It is the goal of the course to:
1.   Cause the student to be an active learner.
2.   Aid the student to develop increased confidence in their ability to conceptualize
and   perform mathematics.
3.   Enhance the student's understanding of fundamental principles underlying
calculus.
4.   Prepare the students to apply calculus to other disciplines.
5.   Inspire students to continue the study of mathematics.
6.   Provide an experience wherein students enjoy learning and applying mathematics.

Outcomes: At the end of this course, a student should be able to:
1. Evaluate logarithmic integrals.
2. Evaluate inverse trigonometric integrals.
3. Use integrals to determine the area between two curves, the volume of a solid of revolution, the arc length of a graph of a function and the surface area of a solid of revolution.
4. Use integration to solve problems from physics such as the mass of a planar lamina, determining the center of mass of a planar lamina, and work.
5. Apply various integration techniques (integration by parts, trigonometric substitution, partial fractions and integration by tables) to solve various integration problems.
6. Evaluate limits using L'Hospital's Rule.
7. Evaluate improper integrals.
8. Determine the behavior of a series using various techniques and tests such as the Integral test, Ratio test and Root test.
9. Approximate functions using polynomials.
10. Integrate and differentiate power series.
11. Graph and analyze parametric equations.*
12. Find the derivative of parametric functions.*
13. Convert between Cartesian and polar coordinates.*

14. Graph simple polar functions.*
15. Differentiate and integrate polar functions.*

* If these topics are not covered in MAT 254, they will be covered in MAT 268