Minnesota State University Moorhead

MATH 261: Calculus I

A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 3

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites:
This course requires any of these three prerequisite categories
  1. Both of these
        MATH 127 - College Algebra
        MATH 143 - Trigonometry
    Or
  2. Both of these
        MATH 127L - College Algebra with Lab
        MATH 143 - Trigonometry
    Or
  3. MSUM Math Above MATH 127

Corequisites: MATH 260 and PHYS 200

MnTC Goals: Goal 04 - Mathematical/Logical Reasoning

Calculus of one variable-differentiation, introduction to the integral. Students entering Math 261 should have a solid background in algebra and trigonometry. Must have successfully completed College Algebra and Trigonometry or acceptable placement score. MnTC Goal 4.

B. COURSE EFFECTIVE DATES: 11/12/1996 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Formal definition of limits and continuity.
2. Techniques for finding limits, including limits involving infinity.
3. Formal definition of the derivative and the concept of the derivative as a rate of change.
4. Differentiation techniques.
5. Implicit differentiation and related rates.
6. Using the first and second derivatives to understand and interpret graphs of functions.
7. Extrema of functions, optimization problems, and other applications of the derivative.
8. Indefinite and definite integrals.
9. The Fundamental Theorem of Calculus.
10. Finding the area under the graph of a function, numerical integration.

D. LEARNING OUTCOMES (General)

1. Understand limits and the derivative and how to use them to describe real-world phenomena.
2. Read and interpret information presented in graphical form.
3. Use the derivative to solve real world optimization problems.
4. Understand numerical solutions to problems and error analysis.

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. Explain what constitutes a valid mathematical/logical argument(proof).
4. Apply higher-order problem-solving and/or modeling strategies.

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted