Minnesota State University Moorhead

MATH 227: Survey of Differential Calculus with Algebra

A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 4

Lab Hours/Week: *.*

OJT Hours/Week: *.*

Prerequisites:
This course requires any of these five prerequisites
MATH 099 - Intermediate Algebra
A score of 23 on test ACT Math
A score of 60 on test Intermediate Alg Placement Test - CAT
A score of 540 on test OLD-SAT Math
A score of 540 on test SAT Math Composite

Corequisites: None

MnTC Goals: Goal 04 - Mathematical/Logical Reasoning

Review of topics in college algebra with emphasis on solving systems of equations with unique solutions, under determined and overdetermined systems. Introduction to matrices, multiplication of matrices and inverse of a square matrix with emphasis on systems of equations and applications. Derivatives, applications of differentiation and optimization. Not open to mathematics majors or minors. Must have successfully completed MDEV 099 or acceptable placement score. MnTC Goal 4.

B. COURSE EFFECTIVE DATES: 10/07/2013 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

D. LEARNING OUTCOMES (General)

1. Apply rational exponents, radicals and logarithmic functions to problem solving.
2. Apply rational exponents, radicals and logarithmic functions to problem solving.
3. Apply the basic definition of derivative.
4. Apply the basic rules of differentiation to compute derivatives, including the product, quotient, chain rule, and higher order derivatives.
5. Compute and problem solve situations involving compound interest.
6. Compute derivatives for exponential and logarithmic functions.
7. Determine an equation of a line.
8. Factor polynomial and rational expressions.
9. Graph equations and determine whether a given graph qualifies as a function or not.
10. Graph linear equations and identify slope and intercepts.
11. Identify, notate, graph, and be able to apply systems of equations to problem solving, including those with unique solutions, as well as overdetermined and under determined systems.
12. Model situations using functions and function notation.
13. Perform operations on functions using the algebra of functions.
14. Recognize and solve optimization problems using differentiation.
15. Recognize when to apply first and second derivatives in problem solving and apply those processes to problem solving.
16. Represent and compute one-sided limits and determine continuity.
17. Simplify polynomial and rational expressions.
18. Simplify, algebraically manipulate, and solve equations involving rational, exponential and radical expressions.
19. Solve equations and inequalities.
20. Use matrices to represent systems of equations, and solve systems of equations using matrix algebra including multiplication of matrices and finding the inverse of a square matrix.

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

None noted