



COMMON COURSE OUTLINE: Course discipline/number/title: MATH 1119: Applied Calculus

A. CATALOG DESCRIPTION

1. Credits: 3
2. Hours/Week: 3
3. Prerequisites (Course discipline/number): MATH 1113 or MATH 1115 or MATH 1117 or appropriate RCTC placement score.
4. Co-requisites (Course discipline/number): None
5. MnTC Goals (if any): CT, MA

This course is a college level introductory calculus course with emphasis on applications. Topics include but are not limited to: limits, derivatives, continuity, first and second derivative test for relative extrema, applications of absolute max/min, integration, continuous money flow, partial derivatives.

B. DATE LAST REVISED (Month, year): May, 2008

C. OUTLINE OF MAJOR CONTENT AREAS:

1. Algebra review
2. Math modeling with regression
3. Limits and continuity
4. Differentiation
5. Applications of derivatives
6. Exponential growth and decay
7. Integration
8. Functions of several variables
9. Marginal Revenue, Marginal Cost, Marginal Profit

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

1. Given points, can find unique polynomial
2. Given points, can find equation of best fit using regression
3. Can find limits at infinity and points of discontinuity
4. Given polynomial function, can find
 - a) All relative extrema
 - b) All inflection points
 - c) Intervals on which function is increasing/decreasing
5. Given rational function, can find
 - a) All relative extrema
 - b) All asymptotes
 - c) All intercepts
 - d) Sketch graph
6. Given polynomial function, can find definite integral
7. Given two polynomial functions, can find area bounded by them
8. Given cost and revenue information, can find
 - a) Marginal cost
 - b) Marginal revenue
 - c) Marginal profit
9. Given continuous money flow, can find present and/or future value
10. Given rate of growth/decay can find doubling time/half-life
11. Given function of several variables, can find max/min

Optional Topics

1. Given function of two variables, can find volume
2. Write programs for graphics calculator
3. Derive formula for linear regression using partial derivatives



E. LEARNING OUTCOMES (MNTC): Competencies from the Minnesota Transfer Curriculum (MNTC):

Goal 2: Critical Thinking (CT): The student will be able to:

1. Gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive, and conscious of possible bias in the information selected.
2. Imagine and seek out a variety of possible goals, assumptions, interpretations, or perspectives, which can give alternative meanings or solutions to given situations or problems.
3. Analyze the logical connections among the facts, goals, and implicit assumptions relevant to a problem or claim; generate and evaluate implications that follow from them.
4. Recognize and articulate the value assumptions, which underlie and affect decisions, interpretations, analyses, and evaluations made by ourselves and others.

Goal 4: Mathematics/Symbolic Systems (MA): The student will be able to:

1. Illustrate historical and contemporary applications of mathematics/logical systems.
2. Clearly express mathematical/logical ideas in writing.
3. Explain what constitutes a valid mathematical/logical argument (proof).

F. METHODS FOR EVALUATION OF STUDENT LEARNING:

1. Tests over covered Topics
2. Quizzes
3. Homework
4. Group Assignments
5. Comprehensive Final Exam

G. SPECIAL INFORMATION (if any):

A graphing calculator is required.