DEPT. MATH  COURSE NUMBER:  1118

NUMBER OF CREDITS:  4

COURSE TITLE:  MATH 1118 Applied Calculus

CATALOG DESCRIPTION : A one-semester tour of differential and integral calculus in one variable. Emphasis on formulas and their interpretation and use in applications. If your program calls for “short calculus” or “brief calculus” or “applied calculus,” this is probably the course you want. Engineering students should take the Calculus sequence: MATH 1121-1122. If you have concerns about which course to take, contact the instructor. Prerequisite: Precalculus, MATH 1113, or College Algebra, MATH 1111, or equivalent placement.

AUDIENCE : This is a calculus course for non-majors, and non-engineering students. If your program calls for “short calculus” or “brief calculus” or “applied calculus,” this is probably the course you want. Engineering students should take the Calculus sequence: MATH 1121-1122

FULFILLS MN TRANSFER CURRICULUM AREA(S) *(Leave blank if not applicable)*
Area:  4  by meeting the following competencies: a,b,c,d

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE: Precalculus, MATH 1113, or College Algebra, MATH 1111, or equivalent placement.

LENGTH OF COURSE : 1 semester

THIS COURSE IS USUALLY OFFERED:
Every other year  fall  spring  summer  undetermined  X

Four goals are emphasized in course at Minnesota West Community & Technical College:

1) ACADEMIC CONTENT: The academic objectives of this course are:
  a. To understand and apply the basic properties of different types of functions
  b. To understand and apply the basic properties of differential calculus
  c. To understand and apply the basic properties of integral calculus
2) THINKING SKILLS: This course will help students improve the effectiveness of their thinking skills through:
   a. Learning to set up mathematical models to represent real-life situations
   b. Learning to assess mathematical models developed by others
   c. Recognizing the assumptions and limitations of mathematical modeling.

3) COMMUNICATIONS SKILLS: This course will help students improve their oral and written communication skills through:
   a. Learning to communicate mathematical ideas with precision and accuracy
   b. Learning to critique and evaluate mathematical models

4) HUMAN DIVERSITY: This course will help students recognize, understand, and appreciate human diversity through:
   a. Seeing the wide range of applications of calculus ideas throughout disciplines and cultures
   b. Appreciating the many contributions made to calculus and mathematics from diverse cultures throughout history

TOPICS TO BE COVERED:

2. Review of Polynomial, Power, Exponential and Logarithmic Functions
3. Limits and the Derivative, Basic Properties
4. Differentiation Rules – product, quotient, chain, implicit differentiation
5. Derivatives of Exponential and Logarithmic Functions
6. Applications – Related Rates, Optimization
7. Integration – Basic Properties and Rules
8. Applications – Simple Differential Equations, Area, other applications
9. Functions of Several Variables and Partial Derivatives

LIST OF EXPECTED COURSE OUTCOMES:

1. Student will be able to identify basic properties of different families of functions: linear, polynomial, rational, power, exponential, logarithmic.
2. Student will be able to evaluate limits by algebraic manipulation.
3. Student will be able to calculate derivatives of any linear, polynomial, rational, power, exponential or logarithmic functions.

4. Student will be able to set up and solve related rate models.

5. Student will be able to set up and solve models for optimization using single-variable differentiation.

6. Student will be able to calculate antiderivatives using the powers rule, and simple substitutions.

7. Student will be able to solve elementary differential equations of the form \( \frac{dy}{dx} = f(x) \) and \( \frac{dy}{dx} = f(x)g(y) \)

8. Student will be able to set up and solve simple integral applications such as area.

9. Student will be able to calculate partial derivatives of functions of several variables.

LEARNING/TEACHING TECHNIQUES used in the course are:

- Collaborative Learning
- Student Presentations
- Creative Projects
- Lecture
- Demonstrations
- Lab

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

- Reading
- Oral Presentations
- Textbook Problems
- Group Problems
- Other (describe below)

- Tests
- Worksheets
- Papers
- Term Paper

- Individual Projects
- Collaborative Projects
- Portfolio
- Web-based practice and demonstration

EXPECTED STUDENT LEARNING OUTCOMES: Same as course outcomes.

The information in this course outline is subject to revision

To receive reasonable accommodations for a documented disability, please contact the campus Student Services Advisor or campus Disability Coordinator as arrangements must be made in advance. In addition, students are encouraged to notify their instructor.

Veteran Services: Minnesota West is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with scheduled course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Minnesota West Veterans Service Office.
This document is available in alternative formats to individuals with disabilities by contacting the Student Services Advisor or by calling 800-658-2330 or Minnesota Relay Service at 800-627-3529 or by using your preferred relay service.

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