BERGEN COMMUNITY COLLEGE
DIVISION OF MATHEMATICS, SCIENCE AND TECHNOLOGY
DEPARTMENT OF MATHEMATICS

COURSE SYLLABUS

MAT-280 CALCULUS I

COURSE DESCRIPTION: Calculus I is a study of limits, continuity, the derivative of a function, differentiation of algebraic, trigonometric, inverse trigonometric, exponential and logarithmic functions, applications of the derivative, antidifferentiation, area under a curve, the definite integral, the Fundamental Theorem of the Calculus and its applications.

CREDITS/HOURS: 4 credits,   4 hours

PREREQUISITE: MAT-180 with a grade of C or better or by proficiency examination.

GENERAL EDUCAION COURSE: Yes

STUDENT LEARNING OBJECTIVES: **Upon successful completion of this course, the student will be able to:**

1. Evaluate and interpret limits.
2. Recognize and interpret continuous functions.
3. Demonstrate the ability to analyze and solve problems involving rates of change by applying the derivative.
4. Solve related rates and optimization problems using calculus techniques.
5. Sketch curves using techniques of calculus.
6. Use differentials in the solution of applied problems.
7. Evaluate definite and indefinite integrals using basic formulas and substitution method.
8. Find the area between two curves.

ASSESSMENT MEASURES: Each of the above listed student learning objectives will be assessed by:
 1. Written assignments and/or quizzes
 2. Written examinations
 3. Other, as announced by the instructor.

COURSE GRADE: Students should refer to the instructor's grading policy which will be distributed during the first meeting of the class.

TEXTBOOKS: **Calculus, Early Transcendentals Functions**, **with CalcChat® and CalcView®**, 7th Edition, Larson/Edwards, Cengage Learning Publisher.

COURSE CONTENT:

TOPIC	CHAPTER	SECTIONS

1. Brief Review of Precalculus   1   1 – 3, 5, 6
    a. Graphs and Models
    b. Linear Models and Rates of Change
    c. Functions and Their Graphs
    d. Inverse Functions including Inverse Trigonometric
       functions
    e. Exponential and Logarithmic functions

2. Limits and their Properties   2   1 - 5
    a. A Preview of Calculus
    b. Finding Limits Graphically and Numerically
    c. Evaluating Limits Analytically
    d. Continuity and One-sided Limits
    e. Infinite limits

3. Differentiation   3   1 - 6
    a. The Derivative and the Tangent Line Problem
    b. Basic Differentiation Rules and Rates of Change
    c. Product and Quotient Rules and Higher-order Derivatives
    d. The Chain Rule
    e. Implicit differentiation
    f. Derivative of Inverse Functions

4. Applications of Differentiation   3   7
         4   1 - 8
    a. Related Rates
    b. Extrema on an Interval
    c. Rolle's Theorem and the Mean Value Theorem
    d. Increasing and Decreasing Functions and The First Derivative Test
    e. Concavity and The Second Derivative Test
    f. Limits at Infinity
    g. A Summary of Curve sketching
    h. Optimization problems
    i. Differentials

5. Integration   5   1 – 5, 7
    a. Anti-derivatives and indefinite integration
    b. Area under a curve
    c. Riemann sums and definite integrals
    d. The Fundamental Theorem of Calculus
    e. Integration by substitution
    f. Area of a region between two curves   7   1

REFERENCES: Calculus: Early Transcendentals, Stewart, Brooks/Calc.
Calculus: Early Transcendental Function, Smith and Minton, McGraw Hill
Calculus: Early Transcendentals, Thomas, Addison Wesley
3000 Solved Problems in Calculus, Shaum's Solved Problem Series,
McGraw-Hill Pub.

ELECTRONIC
DEVICES: **The Department of Mathematics prohibits the use of cell-phones, PDA's, laptops, headphones, IPODs and other such devices in mathematics classes unless otherwise specified in the grading policy provided by the instructor at the beginning of the semester.**

FACULTY
ABSENCE
PROCEDURE: CLASS CANCELLATIONS may be found at http://www.bergen.edu/classcancellations
A list is also posted in a glass case near A-129, the main corridor on the first floor and in Ender Hall. If a cancelled class is not listed, it should be reported to the Mathematics Department Office or the Adjunct Office (C-107).

WEBSITE: Go to http://www.bergen.edu/academics/academic-divisions-departments/mathematics
for more information regarding the Mathematics Department.

STUDENT	Learning Assistance Center	Room:	L-125	879-7489
SUPPORT	Math and Science Walk-In	Room:	L-131	879-7489
SERVICES:	Office of Specialized Services	Room:	L-115	612-5269

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