Montgomery County Community College
MAT 142
Calculus for Business and Social Science
3-3-0

COURSE DESCRIPTION:
A one semester calculus course containing an introduction to differential and integral calculus using algebraic, exponential and logarithmic functions. A graphing calculator is required for class, homework and testing. Classroom instruction and programs will be presented using a TI 84 Plus.

REQUISITES:
Previous Course Requirements
- MAT 140 Finite Mathematics for Business with a minimum grade of "C"

Concurrent Course Requirements
None

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS
1. Use the concepts of limits and continuity to solve problems.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes	Exams Quizzes Homework Projects
2. Solve applications involving average and instantaneous rates of change.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
3. Compute the derivative of algebraic, exponential, and logarithmic functions by the definition, product rule, quotient rule and chain rule.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS

4. Use derivatives to graph functions, find relative and absolute maxima and minima and concavity of a function.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
5. Solve optimization, elasticity, marginal and other applications using the derivative.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
6. Graph and solve equations involving exponential and logarithmic functions.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
7. Compute anti-derivatives for algebraic, logarithmic, and exponential functions.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
8. Solve integration by substitution problems.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
9. Discuss the concepts of Riemann Sums and apply Definite integral and the Fundamental Theorem of Calculus.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
10. Solve applications using the Fundamental Theorem of Calculus.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria*.

SEQUENCE OF TOPICS:

1. Graphical Analysis of Limits
2. Continuous Functions
3. Derivative: Rate of Change, Tangent to a Curve, Derivative Formulas
4. Product and Quotient Rules, Chain Rule and Power Rule, Using Derivative Formulas
5. Higher-Order Derivatives, Applications of Derivatives in Business and Economics
6. Relative Maxima and Minima, Curve Sketching (Polynomial Functions Only), Concavity, Points of Inflection
7. Optimization in Business and Economics, Applications of Maxima and Minima
8. Exponential Functions, Logarithmic Functions, Solutions of Exponential Equations, Applications of Exponential and Logarithmic Functions
9. Derivatives of Logarithmic Functions, Derivatives of Exponential Functions, Applications in Business and Economics
10. Indefinite Integral, The Power Rule
11. Integrals Involving Logarithmic and Exponential Functions, Applications of the Indefinite Integral in Business and Economics
12. Area Under a Curve
13. The Definite Integral, The Fundamental Theorem of Calculus, Area Between Two Curves
14. Applications of Definite Integrals in Business and Economics

LEARNING MATERIALS:
Harshbarger, Ronald J. & Reynolds, James J. (2015). *Mathematical Applications for the Management, Life, and Social Sciences* (11th ed.). Cengage.
If a student has a TI-83+, they do not need to buy a TI-84+.

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:

Prepared by:	Roseanne Hofmann	Date:	4/1998
Revised by:	Roseanne Hofmann	Date:	3/2000
Revised by:	Walter R. Hunter, Professor of Mathematics	Date:	10/2004
Revised by:	Walter R. Hunter, Professor of Mathematics	Date:	5/2005
VPAA/Provost Compliance Verification:	Dr. John C. Flynn, Jr.	Date:	9/11/2009
Revised by:	Mark McFadden	Date:	2/1/2013
VPAA/Provost or designee Compliance Verification:	Victoria L. Bastecki-Perez, Ed.D.	Date:	2/20/2013
Revised by:	Marion Graziano/James Muscatell	Date:	8/31/2017
VPAA/Provost or designee Compliance Verification:		Date:	11/13/2017

This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.