

MIDSTATE COLLEGE
411 W. NORTHMOOR RD. PEORIA, IL 61614
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Winter 2017-2018

Course number & Name: MAT 161 Calculus for Business, and Social Sciences

Credit hours: 6 quarter hours

Method of Delivery: Flex/Night

Instructor Information: Michael Mayers, (309) 357-4497, mfmayers@midstate.edu

Office Hours: Thurs 5:00 – 6:00 p.m. Room 126

Textbook: Calculus For Business, Economics, Life Sciences, and Social Sciences, 13th ed., 2015

ISBN: 032119991X

Author: Barnett, Ziegler, and Byleen

Publisher: Pearson

Mathematic Software: We use GeoGebra to enhance the learning of mathematical concepts. This program is installed on all the computers in Room 206A. You will find it on your desktop. To install it at home go the following link: <http://www.geogebra.org/download>.

Prerequisite(s): MAT 140 College Algebra

Course Description:

This course is presented as an applied approach to the calculus and is intended for students who have had at least two years of high school algebra and trigonometry or who have taken college algebra course at an accredited university or college. This course does not count toward a major or minor in mathematics. Fundamental concepts covered will be limits, formulas for finding derivatives, higher derivatives, definite and indefinite integrals, the fundamental theorem of calculus and substitution techniques.

Requirements for Completing the Course: To successfully complete this course, the student must receive a passing grade as outlined in the Grading Scale and Grading Specifications sections of this syllabus.

Topics to be covered: Linear functions, quadratic functions, polynomial and rational functions, exponential and logarithmic functions. Introduction to limits, continuity, the derivative, derivative rule, marginal analysis, first derivative and second derivative tests, graphing, optimization, exponential and logarithmic derivatives, implicit differentiation, related rates, antiderivatives and indefinite integrals, integration by substitution, growth and decay, the fundamental theorem of calculus, applications in business and economics.

Course Objectives: Upon completion of this course, the student will be able to:

1. Explain the concepts of function, derivative and the definite integral, in writing and using graphical, numerical, and algebraic ideas.
2. Determine the derivative of the elementary functions (polynomial, trigonometric, rational, exponential, logarithmic) at a point using numerical, graphical, and algebraic techniques.
3. Determine the definite integral of the elementary functions using numerical, graphical, and algebraic techniques.
4. Interpret the derivative and definite integral in a variety of problem settings.
5. Algebraically differentiate the elementary functions using the rules for differentiation including the chain rule with a high degree of accuracy.
6. Find anti-derivatives for some elementary functions directly or using substitution.
7. Solve optimization problems given a reasonable real world setting and appropriate data.
8. Relate a function to its derivative and anti-derivatives graphically, numerically, and algebraically.
9. Apply calculus to solve problems in business economics, life sciences, and social sciences.

Midstate Grading scale:

| | |
|----------|---|
| 90 - 100 | A |
| 80 - 89 | B |
| 70 - 79 | C |
| 60 - 69 | D |
| 0 - 59 | F |

Midstate College Plagiarism Policy

Plagiarism is using another person's words without giving credit to the author. Original speeches, publications, and artistic creations are sources for research. If students use the author's words in a paper or assignment, they must acknowledge the source. Plagiarism is strictly against the academic policy of the college and is grounds for failing the course. If repeated, plagiarism may result in suspension from the college. (See the Midstate College catalog and/or Student Handbook for additional information.)

In courses containing writing assignments, the college promotes the use of an electronic resource which compares the student's writing against previously submitted papers, journals, periodicals, books, and web page. Students and instructors can use this service to reduce the incidence of plagiarism. This electronic resource has been found to conform to legal requirements for fair use and student confidentiality. It is able to provide a report to the student indicating the parts of the assignment that match.

Student Success:

Flex courses are taught both on-campus and through eLearning. Flex courses offer personalized learning where students can choose each week whether they want to attend on-campus, via eLearning, or both.

- On-campus = If a student attends an on-campus course, he or she will be counted as present.
- eLearning = To be considered in attendance for an eLearning course, the student must participate each week by submitting substantial, gradable work.

Student Success:

The Office of Student Success is available to students seeking tutoring for individual classes or who need assistance with writing assignments. Information is also available on test taking techniques, how to take notes, developing good study skills, etc. Contact Student Success in Room 110 (in person); (309) 692-4092, extension 1100 (phone); studentsuccess@midstate.edu (email).

Syllabus Changes: This syllabus is subject to change. Any changes will be announced in class.

Participation Requirements/Policies and Procedures:

1. Attendance: Regular attendance is expected. Some of the material covered in class may not be found in the textbook and hence skipping class can be disastrous. **If you Miss a class, it is your responsibility to catch up on all material that you missed.** Unexcused absences will result in the reduction of the final course grade. It is the student's responsibility to notify the instructor, preferably in advance, when a class will be missed. If the instructor receives no call or email within one day of the missed class period, you will be considered missing.
2. Homework: Weekly homework will be assigned on the material covered that week. The odd problems will be assigned, and you must **SHOW WORK** to receive credit on the homework.
3. Quizzes: Quizzes will be given upon the completion of a chapter, roughly on a weekly basis.
4. Exams: There will be 2 exams given – a midterm and a final.

Grading Specifications:

| | | |
|---------------------------|-----|------------------------|
| Attendance/participation: | 20% | |
| Homework: | 15% | (Completion with work) |
| Quizzes: | 25% | |
| Exams: | 40% | (Midterm and Final) |

Examination Information: The exams will cover material that has been discussed in class or covered in the book.

MAT 161 Calculus for Business, and Social Sciences

Tentative Weekly Schedule

| Week | Date | Chapter | Topic | Assignment Due | Learning Objective |
|------|-------|---------------------|---|----------------|------------------------------|
| 1 | 11/16 | Ch1 | Elementary Function & What is Differential Calculus? | | No.1, No.2 |
| 2 | 11/23 | | Thanksgiving | | |
| 3 | 11/30 | Ch2 Ch3 | Limits, Continuity, Derivative, Chain Rule, Implicit Differentiation | HW 1 | No.1, No.2 |
| 4 | 12/7 | Ch3 Ch4 | Related Rates & Optimization | HW 2 | No.2, No.4, No.7, No.8, No.9 |
| 5 | 12/14 | Ch4 | Optimization & Midterm Review | HW 3 | No.2, No.4, No.7, No.8, No.9 |
| 6 | 12/21 | Midterm Exam | | | |
| 7 | 1/11 | Ch5 | What is Integral Calculus? The Fundamental Theorem of Calculus | HW 4 | No.1, No.3 |
| 8 | 1/18 | Ch5 | Indefinite and Definite Integration, Integration by Substitution, | HW 5 | No.1, No.3 No.4, No.5, No.6 |
| 9 | 1/25 | Ch5 | Logarithmic and Exponential Functions Differential Equation; Growth & Decay | HW 6 | No.3, No.4 No.5, No.6, No.9 |
| 10 | 2/1 | Ch6 | Applications of the definite integral | HW 7 | No.3, No.4, No.6, No.9 |
| 11 | 2/8 | | Final Review (Comprehensive) | | |
| 12 | 2/15 | Final Exam | | | |