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Course Description: An introduction to the basic concepts of differential and integral calculus for business majors. Topics include limits, continuity, differentiation and integration of polynomial, exponential and logarithmic functions, with applications to business.

Prerequisite: MAC 1105 with a grade of "C" or better.

Credit: 3 Semester hours

Assistance: Please feel free to contact me if you have questions. I am always available to help you during my office hours. If I am at the campus I may help you during my campus hours too. Use e-mail or call me if you cannot come to my office in person. I will respond to you during my office hours and in a timely basis. The tutorial services of the Mathematics Lab, room 2222, are also available to students registered in any math course taught on campus. There, you will find course-related videotapes, computer software, and tutors that can help you successfully complete this course. Make full use of many resources available to you: The textbook, the Math Lab, your peers, your professor, and the media services REMEMBER: My office hours may not coincide with time right after/before class. I may have other commitments during these times, including teaching another class, at another room or building. Therefore, do not expect the professor to address individual concerns during the 10-minute break in between classes. Plan to contact me during my office hours.

Reading and Writing Components: It is the policy of M-DCC to emphasize reading and writing as part of any course whenever possible. We will focus on reading and writing mathematically as these two elements apply to the learning outcomes of this course.

Classroom Etiquette: Please refrain from bringing food or drinks into classroom. Please turn off any cellular phones and pagers. If your cell phone rings during any tests or pop quizzes you will be asked to leave the room, turn in your test/quiz and will receive an F in the assessment. You are expected to arrive on time to class, depart when the class has concluded and treat others respectfully. You are encouraged to ask questions.
**Homework:** I expect you to spend **at least 4 hours** a week doing homework for this course. Homework for each unit is assigned and I strongly recommend that you do all your homework because this is the best way to prepare for the quizzes and for the unit tests. Use the math lab for assistance with your homework. PLEASE ALSO USE THE ONLINE LEARNING CENTER at www.mhhe.com/hoffmann. You will find additional resources that will help you better understand the course and help you with your homework. Often, I will use a homework question in a quiz. Remember, students need practice to retain a concept learned in class. By doing your homework you will probably contribute to this knowledge retention and set yourself for success in this course.

**Grading:** You will be graded on a total of 100 points. You will have 3 tests, 1 group project, 1 Final Exam, several pop quizzes, and class participation assessments.

<table>
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<tr>
<th>Test</th>
<th>Points</th>
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**TOTAL** 100 points

The additional assessments contribute to the 100 points in the following way: The unannounced pop quizzes and class participation grades will be averaged into one additional grade. This additional grade is also worth 20 points. This grade will replace the single lowest test, BUT NOT THE FINAL EXAM, if the additional grade is higher than the test. If you miss one of the 3 tests, then your grade on the missed test is a zero and the additional grade will replace the one grade of the missed test. There are NO make-ups on any of the 3 tests, final exam, project or quizzes. I will not accept projects after the due date. The group project has a due date which is the beginning of the class when the project will be presented. On this day, the vast majority of your project group needs to be in class for the presentation, otherwise your group receives a zero for the project. See below the conversion between numerical points earned and letter grade.

| 90-100 points | A |
| 80 - 89 points | B |
| 70 - 79 points | C |
| 50 - 69 points | D |
| below 50 points | F |

**Attendance:** Attendance is a contributing factor for the successful learning of academic material. Attendance is required and will be recorded daily. In case of absence, a student is responsible for the material covered, and will not be allowed to make-up quizzes or tests given that day. If a student is absent for a period of two weeks or longer, the instructor can purge the student from the class.
Notes:
1) All test dates will be confirmed during the class prior to the test.
2) A scientific or a graphic calculator is required.
3) The use of calculators is permitted on all quizzes, tests and final exam, but no sharing of calculators between students is allowed during these times.
4) A student who has earned A’s in all 3 tests and an A for the group project is exempt from the final exam. This student will receive an A for the course.
5) The professor reserves the right to add, rearrange, or change material to fit the available time. All changes will be announced during class.

Drop Date: The last date to withdraw with grade of W is July 14. If you decide to drop, it is your responsibility to notify the registrar's office by this date.

Learning Outcomes:
1) Understand intuitively what limit means, and evaluate certain limits by using limit properties.
2) Understand and be able to work with one-sided limits.
3) Know the definition of continuity and be able to apply it to certain problems dealing with continuity.
4) Use properties of continuous functions and theorems regarding continuity to test a function for continuity at a point or on an interval.
5) Find the derivative of certain functions using limits in the definition.
6) Know the definition of differentiability of a function $f$ at a given number and know that a differentiable function is also continuous.
7) Understand that the derivative is the slope of the tangent to the graph of $y = f(x)$ at $x$.
8) Know how to optimize a function of two variables.
9) Apply derivatives to problems involving position, velocity and acceleration of a moving object.
10) Use formulas to find marginal rates of change in applicable business problems.
11) Find derivatives which require the use of the power rule, the product rule, the quotient rule and the chain rule.
12) Find higher order derivatives for certain functions.
13) Use the first and the second derivatives to solve problems involving the motion of objects moving in a straight line.

14) Know how to find the derivative by implicit differentiation and know how to use implicit differentiation to solve problems involving related rates.

15) Understand and apply differentials to approximate the error in a calculated value.

16) Determine for certain functions whether they are increasing or decreasing.

17) Determine for certain functions whether they are concave up or concave down.

18) Use the first derivative test for local extrema.

19) Use the second derivative test for local extrema.

20) Determine where inflection points exist for certain functions.

21) Evaluate limits involving infinity.

22) Understand how limits are used to define horizontal and vertical asymptotes.

23) Graph certain polynomial, radical and rational functions.

24) Solve certain word problems of a geometric nature which requires us to find where a function achieves a maximum or a minimum (optimization problems).

25) Solve certain word problems related to business which requires us to find where a function achieves a maximum or a minimum (optimization problems).

26) Differentiate exponential and logarithmic functions.

27) Solve compound interest problems, exponential growth and decay problems and simple bounded growth problems.

28) Calculate the effective rate of interest on an investment.

29) Define an antiderivative of \( f(x) \).

30) Solve problems which require using basic integral formulas.

31) Evaluating indefinite integrals using \( u \)-substitution.

32) Understand how the definite integral relates to the area under the graph of \( y = f(x) \) from \( x = a \) to \( x = b \).
33) Evaluate definite integrals using the Fundamental Theorem of Calculus.

34) Apply definite integral in certain problems of business and economics.

35) Understand the concept of functions of multiple variables and know how to find the partial derivatives.