Instructor: Dr. Abdallah Shuaibi  
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Phone #: (773)907-4085  
Office Hours: 

1. WALK-IN OFFICE HOURS  
   Monday & Wednesday: 9:00-9:30 AM; 12:00-1:00 PM; 3:30-4:00 PM  
   Friday: 4:30-5:30 PM

2. BY APPOINTMENT OFFICE HOURS  
   Tuesday & Thursday: 11:00 AM-12:00 PM  
   Monday & Wednesday: 5:30-6:00 PM

Class Time and Place: Monday and Wednesday 9:30 AM- 11:50 AM, Room #: 3973.  
Prerequisite: A grade of C or better in Mathematics 140 and Mathematics 141 or Mathematics 143, or appropriate placement test score or consent of department chairperson.  
Course Description: This is the first course in calculus and analytic geometry. It explores various characteristics and equations of conics and covers techniques of differentiation for algebraic, trigonometric, inverse trigonometric, exponential and logarithmic functions. Topics include: Equations of lines, circles and conic sections, limits and continuity. Derivatives and their applications to curve sketching, maxima/minima and related rate problems. The anti-derivative and definite integral, including change of variables and the fundamental theorem of calculus. Technology and writing as appropriate to the discipline will be emphasized throughout the course.  
Other materials: Students are required to have a scientific or a graphing calculator. You are not allowed to use a cell phone as a calculator.  
Credit Hours: 4 credit hours.  
Course Objectives: 

1. Discuss the equations and characteristics of various conics.  
2. Understand the concepts of a limit, continuity, and differentiability.  
3. Differentiate algebraic, trigonometric, inverse trigonometric, exponential, and logarithmic functions.  
4. Apply the sum, product, quotient, and chain rules of differentiation.  
5. Apply the concepts of differential calculus to contextual (real-world) situations.
6. Understand the concept of an antiderivative and its role in the Fundamental Theorem of Calculus.

**Student Learning Outcomes:**
Upon satisfactory completion of the course, students will be able to:

1. Estimate limits and derivatives graphically and by using tables of values.
2. Calculate limits of functions algebraically.
3. Calculate derivatives of functions using the definition of a derivative.
4. Identify points where a function fails to be continuous or differentiable.
5. Calculate derivatives of functions using the sum, product, quotient and chain rules.
7. Determine the equation of a tangent line to the graph of a function.
8. Approximate changes in a function using differentials.
9. Apply the Intermediate, Mean, and Extreme Value Theorems to a function defined on a closed and bounded interval.
10. Apply derivatives to problems involving optimization and related rates.
11. Analyze the behavior of functions and their graphs using first and second derivatives (e.g., determine local and absolute extrema, concavity, and inflection points).
12. Apply L'Hospital’s Rule to calculate limits of functions.
13. Determine antiderivatives of functions.
14. Apply the concepts of first and second derivatives and antiderivatives to motion problems.
15. Evaluate definite integrals by using the Fundamental Theorem of Calculus.

**General Education Goals:**
This course addresses the following TR General Education Goals:

- The student performs effectively in the workplace and/or has the ability to work and make effective use of wide variety of current technologies. (Gen. Ed. Goal 2)
- The student demonstrates the ability to think critically, abstractly, and logically. (Gen. Ed. Goal 4)
- The student demonstrates the ability to work independently. (Gen. Ed. Goal 6)
Class Operation:

1. Homework: Homework assignments will be collected every week. The quizzes will be based on the homework problems and additional worksheets. Students who keep up the daily work are generally those who do well on quizzes and tests.

2. Web site & Blackboard: It is your responsibility to check the My Web site & the Blackboard regularly for announcements and other important information regarding the course.

3. Quizzes: Throughout the semester, we will have at least 10 quizzes. Quizzes cannot be made up. There are no exceptions. As a result, I will drop the lowest two quizzes. We will not have quizzes on the weeks an exam is scheduled.

4. Tests: There will be two exams during the semester besides the final exam. The final exam is also cumulative, and it will be given during the last week of the semester.

Policies:

- **Participation policy**: Class participation is mandatory. You are expected to attend most of the class sessions. If you have any question, be ready to ask it at the beginning of the class. The average student should plan two hours of out of class time for each hour of class. Some students need more time than this.

- **Make-up Policy**: No make-up exam is given without prior notification and documented acceptable excuse. The student must contact the instructor by telephone or e-mail on the day of the exam if there is a problem. If you know in advance of an unavoidable absence, arrangements can be made to take a test prior to the absence.

- **Attendance Policy**: Students must attend most of the class sessions. They are expected to be there ON TIME. Attendance will be taken daily. If you miss a class, it is your responsibility to obtain the assignment and find out what material was covered.

- **Mathematics Department Active Pursuit of Course Objectives & ADW Policy**: Students are not actively pursuing the course objectives and will be administratively withdrawn (ADW) at midterm if at least two of the following apply:

  1. Less than 70% of assignments up to the midterm have been completed.
  2. Less than 70% of quizzes and tests up to the midterm have been attempted.
  3. Less than 50% of class sessions up to the midterm have been attended.

- **Cell Phones/Beepers policy**: Electronic devices cause disruption during class and are not permitted. In order to respect the learning environment, please turn off all such items prior to class.

**Truman College Academic Integrity Policy**: If the alleged violation of the Academic Integrity policy occurs in the classroom, the instructor will determine if a student has committed an act of academic dishonesty. The instructor may take action commensurate with the severity of the act. The instructor may:
1. Assign a grade ‘F’ or ‘0’ to the assignment or test or appropriate part of the assignment or test.

2. Make a proportional reduction in the grade for an entire assignment, if the assignment is a part of a large assignment.

3. Assign a grade ‘F’ for the course. “See the student Handbook for specifics”.

**Types of Activities:** There will be an emphasis on active and cooperative learning strategies throughout this class. Active Learning is, in short, anything that students do in a classroom other than merely passively listening to an instructor’s lecture. This includes everything from listening practices which help students to absorb what they hear, to short writing exercises in which students react to lecture material, to complex group exercises in which students apply course material to ”real life” situations and/or to new problems. Cooperative learning is a successful teaching strategy in which small teams, each with students of different levels of ability, use a variety of learning activities to improve their understanding of a subject. Each member of a team is responsible not only for learning what is taught but also for helping teammates learn, thus creating an atmosphere of achievement. Some of the class active/cooperative learning strategies are listed below. Think-Pair-Share, Student Summaries, One-Minute Paper, Jigsaw Teamwork, Roundtable, Corners and Shared Brainstorming.

**Weekly Schedule:**

1. [Aug 25-Aug 29]: Introduction to the Derivative(1.1), Limits(1.2), The Derivative as a Limit and the Leibniz Notation(1.3).

2. [Sep 1-Sep 05]: Differentiating Polynomials(1.4), Products and Quotients(1.5).
   \[[Sep 1: Labor Day(Holiday)]]

3. [Sep 8-Sep 12]: The Linear Approximation and Tangent Lines(1.6), Rates of Change and the Second Derivative(2.1).

4. [Sep 15-Sep 19]: The Chain Rule(2.2), Fractional Powers and Implicit Differentiation(2.3).

5. [Sep 22-Sep 26]: Related Rates and Parametric Curves(2.4), Antiderivatives(2.5).

6. [Sep 29-Oct 3]: Continuity and Intermediate Value Theorem(3.1), Increasing and Decreasing Functions(3.2), The Second Derivative and Concavity(3.3).


9. [Oct 20-Oct 24]: Summation(4.1), Sums and Areas(4.2), The Definition of the Integral(4.3).


11. [Nov 3-Nov 7]: Applications of Integral(4.6), Polar Coordinates and Trigonometry[Review](5.1).

12. [Nov 10-Nov 14]: Differentiation of Trigonometric Functions(5.2), Inverse Functions(5.3).
13. [Nov 17-Nov 21]: The Inverse Trigonometric Functions(5.4), Graphing and Word Problems(5.5).

14. [Nov 24-Nov 28]: Graphing in Polar Coordinates(5.6), Exponential Functions(6.1).
   [Review & Exam II]: [Nov 27 & Nov 28: Thanksgiving Holiday]

15. [Dec 1-Dec 5]: Logarithms(6.2), Differentiation of Exponential and Logarithmic Functions(6.3),
   Graphing and Word Problems(6.4).

16. [Dec 8-Dec 12]: [Review & Final Exam].

Grading Policy:

- Exam I @ 20 %.
- Exam II @ 20%.
- Final Exam @ 30 %.
- Quizzes @ 15 %.
- Homework Assignments @ 10 %.
- Class Participation @ 5 %.

Grading Scale:

- (90 - 100)% A
- (80 - 89)% B
- (70 - 79)% C
- (60 - 69)% D
- (0 - 59)% F.

Extra Help!: Many students find that they need extra help in addition to that available in class.
Help is available from the instructor at the times indicated or by appointment. Also, recognize that
others in the class can and are willing to help. You are encouraged to keep in touch with classmates
who have similar schedules. Tutoring is also available at Truman college.

Good Luck

Shuaibi, A.