

MATH 1401 - CALCULUS I

FILE COPY

Instructor: Bruce MacMillan

Office: CU-Denver Building Room 609

Phone: 303-556-4848

Email Address: Bruce.MacMillan@cudenver.edu

Office Hours: Besides being available in the classroom before and after class, I will be in the Math Education Resource Center (Science Building Room 132) on:

Monday: 8:00 - 9:00 AM, 12:00 - 1:00 PM, 2:15 - 3:00 PM

Wednesday: 8:00 - 9:00 AM, 2:15 - 3:00 PM

Other times (Tuesday and Thursday) can be arranged by appointment.

Text: Calculus, Concepts and Contexts, (2nd Edition) by James Stewart

Note: The book is readable and has many good examples.

Course Content: Chapters 1-5

Prerequisites: It must be assumed that a certain competency of advanced algebra and trigonometry has been mastered. To assure that everyone meets this criterion, the Colorado Commission of Higher Education requires placement testing for this course. In order to remain in this course, you must achieve a passing score on the Accuplacer Test (College Level Math) by 7:00 PM on Monday, August 30th. If you fail to meet this requirement, you will be administratively dropped from this course on Tuesday, August 31st. Please read the Accuplacer Information Sheet before visiting the MERC Lab (SI 130) for testing.

Exam Schedule and Grading Policy:

Tests: Three tests, worth 100 points each, will be given plus a comprehensive final exam, counting 150 points. (See Test Schedule on next page.)

Homework Assignments: Homework problems will be given over each section covered and a few of these problems will be collected each week that there is not a test. These 12 assignments will be graded and will be worth 25 points each, with the lowest 2 homework grades dropped at the end of the semester. Assignments are due each Monday, but if they are turned in before class begins on Wednesday there will be no penalty. However, for assignments turned after this time there will be a 5 point penalty. No assignments will be accepted after the beginning of class the following Monday. Please follow these guidelines in turning in homework assignments:

1. All assignments are to be done on engineering paper. Engineering paper can be purchased at the bookstore
2. Show all work neatly since messy papers may not be graded.
3. Include graphs where appropriate. The graphs can either be a sketch or a computer printout with important information identified.
4. Staple your papers together.
5. Make sure you do the assigned problems since no credit will be given for the work on an incorrect problem.

You are able to work together in doing homework assignments, however, copying someone's assignment will not be tolerated. If this occurs, all students involved will receive no credit on the assignment.

Calculus Application Project: One project will be assigned during the semester that will be an extension to the homework assignments. This project can be worked on and completed in pairs and will require the use of a graphing utility. You will have approximately a week to complete the problem and it will be counted 50 points.

Test Schedule: Exam #1 - Wednesday, 9/22
Exam #2 - Wednesday, 10/20
Exam #3 - Wednesday, 11/17
Final Exam - Saturday, 12/11 (9:00-12:00)

Points Summary:

Exams:	300 points
Final Exam:	150 points
Homework Assignments:	250 points (after dropping one)
Application Project:	50 points

Total:	750 points

Your final grade will be determined by the percentage of these points you have actually received.

A: 88% - 100%, B: 76% - 87%, C: 64% - 75%, D: 52% - 63%, F: Below 52%

Note: The bottom 2 percentage points of each letter grade will be assigned a "minus", and the top 2 percentage points will be assigned a "plus".

Other Important Dates:

- 9/2 is the last day to add a class.
- 9/8 is the last day to drop a class with a full refund.
- 11/1 is the last day to drop a class without a petition from the dean.
- 11/12 is the last day to drop a course for CLAS students. This is an absolute deadline.

Note: CLAS students must always have an accurate mailing and email address. To update, go to: <http://www.cudenver.edu/registrar>

Incomplete Grades:

Incomplete grades (IW or IF) are not granted for low academic performance. To be eligible for an Incomplete grade, students must (1) successfully complete 75% of the course, (2) have special circumstances that preclude the student from attending class and completing graded assignments, and (3) make arrangements to complete missing assignments with the original instructor. A CLAS Course completion agreement is strongly suggested.

Computing Technology: During the semester, we will explore calculus graphically, numerically, and algebraically. This course will utilize the TI-89/92 calculator, with graphics capability and a Computer Algebra System, to facilitate the study of calculus. Although this calculator is not a requirement, it will be used in class on a daily basis, and will help in the learning of calculus. All students are required to have a graphing calculator and to be able to use a Computer Algebra System, such as the TI-89/92, or the program DERIVE which is on the computers in the MERC lab. The best advice is to become familiar with a calculator (such as the TI-89) or DERIVE as soon as possible. It will be a worthwhile investment, not only for this course, but for all of your future work.

Frequently Asked Question: How much time should I be spending on my Calculus per week? A "full-time job" is considered to be 40 hours per week and a "full-time student" is considered to have a schedule of 15 hours per week. If you subtract 15 hours of class time from the 40 hours, that leaves 25 hours of studying per week. 4/15 of 25 is 6.7 hours of studying calculus, outside of classtime, per week.

Final Comment: Please turn off all pagers and cell phones at the beginning of class!

Assignment #1:

- 2.1 #4

- 2.2 #4,10

- 2.3 #12,14

- **Problem:** Given: $f(x) = (1 + x)^{1/x}$

a. Sketch a graph of the function on the interval $(-1, \infty)$. If applicable, show all asymptotes with dotted lines and other undefined values with an "open circle".

b. Estimate the limit of $f(x)$ as x approaches 0 by evaluating f for values in the chart below. Round answers to 5 decimal places.

x	-1	-0.01	-0.001	.1	.01	.001
f(x)						

c. Use a Computer Algebra System to find the exact value of:

$$\lim_{x \rightarrow 0} (1+x)^{1/x} =$$

The following is a "tentative" schedule for the semester.

<u>WEEK</u>	<u>SECTIONS</u>	<u>MATERIAL COVERED</u>
8/23	2.1-2.3	Course Expectations, Tangent and Velocity Problems Limit of a Function, Calculating Limits
8/30	2.4 - 2.6	Continuity, Limits at Infinity Tangents, Velocities, and Other Rates of Change
9/6	2.7 - 2.8, 2.10	LABOR DAY The Derivative Relationship between f' and f''
9/13	3.1 - 3.2	Derivatives of Polynomials and Exponential Functions Product and Quotient Rules
9/20	3.3 - 3.4	Rates of Change and Derivatives of Trig Functions Exam #1 (9/22)
9/27	3.5, 1.7	Parametric Equations Chain Rule
10/4	3.6	Implicit Differentiation Inverse Trig Functions and Their Derivatives
10/11	1.6	Data Collection Activity (ILAP) Review of Logarithmic Functions and Their Properties
10/18	3.7 - 3.8	Derivatives of Logarithmic Functions Logarithmic Differentiation Exam #2 (10/20)
10/25	3.8, 4.1	Linear Approximations and Differentials. Related Rates
11/1	4.2 - 4.5	Calculus and Graphs of Functions Indeterminate Forms and L'Hospital's Rule
11/8	4.6, 4.9	Optimization Problems Antiderivatives
11/15	5.1	Areas and Distances Exam #3 (11/17)
11/22		FALL BREAK
11/29	5.2 - 5.4	Definite Integrals Fundamental Theorem of Calculus
12/6	5.5	Substitution Rule Course Review
12/11		FINAL EXAM

Section	Problems
2.1	#1, 3, 5
2.2	Odd #1 - 11, 15
2.3	Odd #1, 9 - 21, 33
2.4	#3, 13, 15, 35, 41
2.5	Odd #3 - 7, 13 - 21, 31
2.6	Odd #1 - 9, 13, 15, 23
2.7	Odd #3 - 7, 19 - 23
2.8	Odd #3 - 11, 19 - 25, 31, 35
2.10	Odd #1 - 5, 11, 15 - 19, 25, 27
3.1	Odd #3 - 21, 29 - 33, 41, 45, 47
3.2	Odd #1 - 7, 11 - 15, 19, 23, 27, 29
3.3	#1, 3, 7, 23
3.4	Odd #1 - 9, 17, 19, 23, 25
3.5	Odd #11 - 25, 31, 35, 49, 65, 67
1.7	Odd #1, 5 - 9, 15
3.6	#1, 3, 9, 15, 25 - 33
1.6	Odd #35 - 39, 45, 49, 51, 57
3.7	Odd #3 - 13, 19, 29 - 37
3.8	Odd #1 - 9, 17, 19
4.1	Odd #1 - 9, 13, 21, 23
4.2	Odd #1 - 5, 25 - 29, 37, 41, 43
4.3	Odd #1, 3, 7 - 11, Worksheet on Curve Sketching
4.5	Every Other Odd #3 - 35
4.6	Odd #1 - 9, 13, 19
4.9	Odd #1 - 13, 21, 23, 27, 35, 37
5.1	#1, 5, 13, 15
5.2	Odd #3, 17, 19, 27 - 39
5.3	Odd #9 - 21
5.4	Odd #3 - 9
5.5	Odd #7 - 13, 19 - 23, 37 - 43

CALCULUS SURVEY

Please complete the following by next class meeting

1. Name: _____

2. Major: _____

3. Email Address: _____

4. Total number of hours you are taking this semester: _____

5. When and where did you take Precalculus (College Algebra/Trig)?

6. How much mathematics is required for your major? How much do you plan to take?

7. Briefly explain your background in mathematics.

8. If you attended high school in the Denver area, what school did you attend and when did you graduate?

9. Anything else you want to tell me about yourself?
