

Calculus I

Time: MW 12:30 – 1:45, F 12 – 1:50
Room: ACR 108

Instructor: Eric Funasaki
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Office hours:

MWF 10 – 10:50, MW 11 – 11:50, TR 9:30 – 10:45, or by appointment.

Textbook:

Calculus: Concepts & Contexts, 4th edition, by James Stewart.

Course Description:

Topics include limits and continuity; the derivative; techniques for differentiation of algebraic, logarithmic, exponential, and trigonometric functions; applications of the derivative; and anti-differentiation.

Prerequisites:

Math 1314 College Algebra and Math 1316 Plane Trigonometry or equivalent scores or courses.

Mathematics Program Learning Objectives:

The student should be able to:

1. Apply knowledge of basic mathematics principles;
2. Identify and provide valid proofs or solutions for theorems or problems; and
3. Recognize and dispute invalid mathematical statements using counterexamples.

Course Objectives:

The student will be able to:

1. Find limits of continuous and discontinuous functions, including limits involving infinity;
2. Find the derivative of algebraic and transcendental functions;
3. Find the derivative of a function using the Product, Quotient, and Chain Rules;
4. Use the derivatives of a function to determine its maximum and minimum values as well as the shape of its graph; and
5. Find the antiderivatives of a function.

EC-6 Core Teacher Competencies:

1. Competency 013 (Mathematics Instruction): The teacher understands how students learn mathematical skills and uses that knowledge to plan, organize, and implement instruction and assess learning.

2. Competency 014 (Number Concepts and Operation): The teacher understands concepts related to numbers, operations and algorithms, and the properties of numbers.
3. Competency 015 (Patterns and Algebra): The teacher understands concepts related to patterns, relations, functions, and algebraic reasoning.
4. Competency 016 (Geometry and Measurement): The teacher understands concepts related to principles of geometry and measurement.
5. Competency 017 (Probability and Statistics): The teacher understands concepts related to probability and statistics and their applications.
6. Competency 018 (Mathematical Processes): The teacher understands mathematical processes and knows how to reason mathematically, solve mathematical problems, and make mathematical connections within and outside of mathematics.

Course Assessment:

Your grade will be based on the following components:

- 8% In-class problems and participation
- 20% Homework assignments and quizzes
- 48% Exams
- 24% Comprehensive Final Exam

The grading scale will be:

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

Course Schedule (tentative):

Week 1

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|------|---|--|
| 8/24 | M | 2.2 The Limit of a Function, 2.3 Calculating Limits Using the Limit Laws |
| 8/26 | W | 2.2 The Limit of a Function, 2.3 Calculating Limits Using the Limit Laws |
| 8/28 | F | 2.2 The Limit of a Function, 2.3 Calculating Limits Using the Limit Laws |

Week 2

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|------|---|---|
| 8/31 | M | 2.4 Continuity, 2.5 Limits Involving Infinity |
| 9/2 | W | 2.4 Continuity, 2.5 Limits Involving Infinity |
| 9/4 | F | 2.4 Continuity, 2.5 Limits Involving Infinity |

Week 3

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|------|---|---|
| 9/7 | M | Labor Day (no class) |
| 9/9 | W | 2.6 Derivatives and Rates of Change, 2.7 The Derivative as a Function |
| 9/11 | F | 2.6 Derivatives and Rates of Change, 2.7 The Derivative as a Function |

Week 4

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|------|---|------------------------------------|
| 9/14 | M | 2.8 What Does f' Say about f ? |
| 9/16 | W | Review for Exam 1 |
| 9/18 | F | Exam 1 |

Week 5

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|------|---|---|
| 9/21 | M | 3.1 Derivatives of Polynomial and Exponential Functions
3.2 The Product and Quotient Rules |
| 9/23 | W | 3.1 Derivatives of Polynomial and Exponential Functions
3.2 The Product and Quotient Rules |
| 9/25 | F | 3.1 Derivatives of Polynomial and Exponential Functions
3.2 The Product and Quotient Rules |

Week 6

9/28	M	3.3 Derivatives of Trigonometric Functions, 3.4 The Chain Rule
9/30	W	3.3 Derivatives of Trigonometric Functions, 3.4 The Chain Rule
10/2	F	3.3 Derivatives of Trigonometric Functions, 3.4 The Chain Rule

Week 7

10/5	M	3.5 Implicit Differentiation 3.6 Inverse Trigonometric Functions and Their Derivatives
10/7	W	3.5 Implicit Differentiation 3.6 Inverse Trigonometric Functions and Their Derivatives
10/9	F	3.5 Implicit Differentiation 3.6 Inverse Trigonometric Functions and Their Derivatives

Week 8

10/12	M	3.7 Derivatives of Logarithmic Functions 3.8 Rates of Change in the Natural and Social Sciences
10/14	W	3.7 Derivatives of Logarithmic Functions 3.8 Rates of Change in the Natural and Social Sciences
10/16	F	3.7 Derivatives of Logarithmic Functions 3.8 Rates of Change in the Natural and Social Sciences

Week 9

10/19	M	3.8 Rates of Change in the Natural and Social Sciences
10/21	W	Review for Exam 2
10/23	F	Exam 2

Week 10

10/26	M	4.2 Maximum and Minimum Values, 4.3 Derivatives and the Shapes of Curves
10/28	W	4.2 Maximum and Minimum Values, 4.3 Derivatives and the Shapes of Curves
10/30	F	4.2 Maximum and Minimum Values, 4.3 Derivatives and the Shapes of Curves

Week 11

11/2	M	4.3 Derivatives and the Shapes of Curves 4.5 Indeterminate Forms and l'Hospital's Rule
11/4	W	4.3 Derivatives and the Shapes of Curves 4.5 Indeterminate Forms and l'Hospital's Rule
11/6	F	4.3 Derivatives and the Shapes of Curves 4.5 Indeterminate Forms and l'Hospital's Rule

Week 12

11/9	M	4.5 Indeterminate Forms and l'Hospital's Rule, 4.6 Optimization Problems
11/11	W	4.5 Indeterminate Forms and l'Hospital's Rule, 4.6 Optimization Problems
11/13	F	4.5 Indeterminate Forms and l'Hospital's Rule, 4.6 Optimization Problems

Week 13

11/16	M	4.8 Antiderivatives
11/18	W	Review for Exam 3
11/20	F	Exam 3

Week 14

11/23	M	4.8 Antiderivatives
11/25	W	Thanksgiving Break (no class)
11/27	F	Thanksgiving Break (no class)

Week 15

11/30 M Review for Final Exam
12/2 W Review for Final Exam
12/4 F Dead Day (no class)

Week 16

12/7 M Finals week (no class)
12/9 W Final Exam (12:30 pm – 2:30 pm)
12/11 F Finals week (no class)

Attendance:

Role will be taken. You are responsible for all material covered in class as well as any assignments and announcements that are made. If you miss an assignment, exam, or quiz you will receive a grade of zero unless I have been notified in advance.

Sul Ross State University policy is to drop a student with a grade of W or F when 9 hours of class are missed. For this course that is when you miss **6** classes.

Cheating:

Cheating will not be tolerated. Anyone caught cheating will receive a grade of zero on that assignment. This includes homework assignments where the student who copied another student's work and the student who allowed their work to be copied will both receive a grade of zero.

Cell Phones and Other Electronic Devices:

Your cell phone must be **off** while you are in class. You may not read or send text messages while class is in session. If there is an unusual situation where you simply must be able to read and send a message without delay, please place your phone in vibrate mode and leave the room before reading and responding. No other electronic devices may be used during class without the permission of the instructor.

ADA Statement:

Sul Ross State University is committed to equal access in compliance with the Americans With Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Mary Schwartze in Counseling and Accessibility Services, Ferguson Hall, Room 112. The mailing address is P.O. Box C-122, Sul Ross State University, Alpine, TX 79832. Telephone: 432-837-8203. E-mail: mschwartze@sulross.edu.

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