MATH 172 Calculus I
SPRING 2022 (Mar 29 – Jun 3)

Instructor: Sahadeb Upretee, PhD
E-mail: upretees@cwu.edu
Office Hours: MTWR 1:00 - 2:00 pm or by appointment
Classroom: Online Web
Class Time: MTWRF (12:00 PM - 12:50 PM)

Hello! You are welcome to the MATH 172 Calculus I.

TEXTBOOK: Active Calculus by Boelkins. This is a free, open-source calculus textbook found at: https://activecalculus.org/single

PRE-REQUISITES: Completion of MATH 154 with a grade of C or higher or an appropriate test score on the mathematics placement exam

COURSE CONTENT: This course covers fundamental concepts of limit, continuity, derivatives techniques and application of derivative in real life modeling.

Learner Outcomes:
Upon successful completion of this course, the student will be able to:

- Determine limits and continuity of functions.
- Determine the derivatives of algebraic functions using the definition of derivative.
- Determine the derivatives of functions.
- Use the concept of the derivative to determine properties of functions.
- Model situations using the derivative of a function.
- Use the first and second derivatives of a function to determine maxima and minima of a function.
- Understand the relationship between the derivative of a function and the function's graphical representation.

Unit 1: Understanding the Derivative

How do we measure velocity?, the notion of limit, the derivative of a function at a point, the derivative function, Interpreting, estimating, and using the derivative, the second derivative, limits, continuity, and differentiability, the tangent line approximation

Learning Outcomes
The students will be able to:

- Explain the meaning of a limit and continuity
- Examine the continuity of functions
- Apply basic limit rules to determine limit
- Understand indeterminate form and evaluate limit by applying L'Hopital rule correctly

Unit 2: Computing Derivatives

Elementary derivative rules, the sine and cosine functions, the product and quotient rules, derivatives of other trigonometric functions, the chain rule, derivatives of inverse functions, derivatives of functions given implicitly

Learning Outcomes
The students will be able to:

- Explain the meaning of derivatives
- Determine the derivatives by using definition
- Apply the product, chain, and quotient rules to evaluate the derivative of algebraic/trigonometric functions
- Use derivative information to draw the graph of functions

Unit 3: Using Derivatives
Using derivatives to identify extreme values, using derivatives to describe families of functions, global optimization, applied optimization, related rates.

Learning Outcomes
The students will be able to:

- Apply the derivative techniques to determine properties of functions such as maxima/minima.
- Find relative and absolute extrema and points of inflection of functions
- Set up and solve applied optimization problems
- Set up and solve applied related rates problems

REQUIRED CALCULATOR: Graphing calculator (TI-83, 84, or similar).

IMPORTANT DATES:
Tuesday, Mar 29 – First day of classes.
Class End: June 4
Study day: June 6
Memorial Day: May 30 – No class
Midterm Exam One: May 2
Midterm Exam Two: May 27
Comprehensive Final Exam: Update later

EVALUATIONS:

Attendance and Participant:	5%
Weekly Assignments:	30%
Midterm Exam One:	20%
Midterm Exam Two:	20%
Comprehensive Final Exam:	25%

GRADING SCALE (MINIMUM CUTOFFS):

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
93	90	87	83	80	77	73	70	67	63	60	below 60

WEEKLY SCHEDULE

Week	Content	Remark
1	1.1 How Do we Measure Velocity 1.2 Notion of a Limit	
2	1.3 Instantaneous Velocity 1.4 The Derivative 1.5 Using the Derivative	
3	1.5 Using the Derivative 1.6 The Second Derivative 1.7 Continuity	
4	2.1 Elementary Derivative Rules 2.2 Sine and Cosine Functions 2.3 Product Rule	
5	2.3 Product rule and quotient rule 2.4 Derivatives of Other trig functions 1.8 Tangent line approximation	
6	2.5 Chain Rule 2.6 Inverse Functions	
7	2.7 Implicit Functions 2.8 Using Derivatives to find limits	
8	3.1 Extreme Values 3.3 Global Optimization	
9	3.3 Global Optimization 3.4 Applied Optimization	
10	3.5 Related Rates 3.2 Using Derivative to Describe Families of Functions	

ZOOM MEETING: Please join real time class by using the following zoom link.

https://cwu.zoom.us/j/84356353298?pwd=bzdmczFRUm5JMzNnRUVPYkV6Sk85UT09

or

To get to your real time class: First Log into Canvas then click on Zoom which is a button in the left-hand menu in Canvas, then click on **Join** icon.

CELL PHONE POLICY

I will not allow cell phones or similar devices to be used during exams. This includes using your phone as a calculator.

TIME INVESTMENT REQUIREMENT:
The information listed below illustrates the total investment of time by an average student to achieve the learning goals of the course. (30 hours/credit x 5 = 150 hours)
The amount of time that an average student should expect to spend on this class is as follows:

- 50 hours - Time spent in the classroom, online instruction, taking exams and doing worksheets etc.
- 100 hours - Time for preparation and study for worksheets, assignment, monthly and final exams, discussion during the office hours.

EMAIL CORRESPONDENCE: I will respond to student communications during business hours (M-F, 8am-5pm). You can typically expect a reply within approximately 24 hours, not including weekends. If you email me with questions about specific problems, I can be more helpful if you send pictures of what you've tried so far.

HOMEWORK: Each week homework will be assigned, and due dates will be announced in the Canvas. Students are encouraged to discuss among the friends but do not copy other's work directly. If I find identical solutions, then both parties will get zero points. Your work should be clear, in a logical order, and provide sufficient explanation. You must upload a single pdf file of the homework into Canvas.

EXAM POLICY: There will be two midterm exams and one comprehensive final exam. All exams are cumulative. They will be taken in Canvas, will be timed, and you will be allowed to use your book and notes. You must upload your written exam as a single pdf file in Canvas.

COURSE POLICIES

COVID-19 STATEMENT:

- As of March 19, 2022, masks will be optional in non-instructional indoor spaces on campus (e.g. hallways, foyers, and other common areas).

- After April 8, 2022, masks will be optional in indoor instructional spaces on campus, with the following exceptions for certain instructional settings:
  a. Any classes (e.g. laboratories or similar) which require close contact. Faculty instructors for such classes will state in their syllabus that masks will be required.
  b. CWU-owned or contracted vans or buses transporting students on field trips or other instruction-related travel. Faculty instructors will state in their syllabus that masks will be required during such travel.

MENTAL HEALTH STATEMENT:

"*Stress and other life circumstances that may be out of your control can make learning and focusing difficult. If you find stress or other mental health concerns make academics difficult, Central has resources to support you. I encourage you to reach out as soon as you notice you're struggling.*"

RESOURCES FOR STUDENTS:

CWU Counseling Center: https://www.cwu.edu/medical-counseling/counseling-clinic

Mental Health Crisis Support outside normal business hours: 1-800 – 273 - 8255, Text HOME to 741741 or call 911.

Wellness Center: https://www.cwu.edu/wellness/ 509-963 -3213

Student Rights and Responsibilities: https://www.cwu.edu/student-rights/office-student-rights-responsibilities

POLICY ON ACADEMIC DISHONESTY:
Students are on their honor to follow the student conduct code as outlined in the Washington Administrative Code. Violations of this section will result in a failing grade in the course in addition to further possible university sanctions. (See http://apps.leg.wa.gov/WAC/default.aspx?cite=106-125)

POLICY ON DIVERSITY:
University-level education is about broadening horizons and looking at academic issues from a variety of perspectives. With this in mind, the participants in this class are encouraged to bring their own life experiences and viewpoints to bear on classroom discussions and assignments. Along with the freedom to express one's own views comes the responsibility to respect the views of others. No student will be discriminated against on the basis of race, ethnicity, age, creed, religion, gender, sexual orientation, marital status, or political ideology.

DISABILITY SERVICES:
Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body. If you anticipate or experience any obstacles to learning, contact Disability Services to discuss a range of available options. Student Disability Services is located in Hogue 126. Call (509) 963-2214 or email ds@cwu.edu for more information. (see https://www.cwu.edu/disability-services/)

SUBMITTING ELECTRONIC FILES:
All electronic files must be submitted in .doc, .docx or .pdf format. If you don't have Microsoft Office, you can download it for free, using your CWU email and password from the MS Office website. Here is the guide on (https://cwu.teamdynamix.com/TDClient/2015/Portal/KB/ArticleDet?ID=9080), how to download MS Office. Mac users make sure to save documents with visible extension (.docx or .rtf).

RELIGIOUS HOLIDAY ABSENCES: In compliance with RCW 28B.137.010, CWU makes every effort to deal reasonably and fairly with students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Students must present written notice to their instructor within the first two weeks of class listing the specific dates on which accommodations are required. Contact the Dean of Student Success at (509) 963-1515 for further information or questions.