

MATH 172 Calculus I
FALL 2020 (Sept 9-Nov 20)

Instructor: Sahadeb Upretee, PhD

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Class Time: MTWRF (9:00 AM - 9:50AM)

Office Hours: MTWR 8:00 - 8:50am or by appointment

Classroom: Online Web

TEXTBOOK: Rogawski, J., Adams C., and Franzosa R. (2018). *Calculus: early transcendentals (4th ed.)*. New York: W.H. Freeman.

PRE-REQUISITES: MATH 154 with a grade of C or higher, a score of 19 on the Advanced Math Placement Test, or a score of 46 or higher on the Compass Trigonometry test.

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

Unit 1: Limit and Continuity

The Limit Idea: Instantaneous Velocity and Tangent Lines, Investigating Limits, Basic Limit Laws, Limits and Continuity, Indeterminate Forms, The Squeeze Theorem and Trigonometric Limits, Limits at Infinity, The Intermediate Value Theorem. Evaluating Limits Algebraically, Trigonometric Limits.

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: Derivatives

Definition of the Derivative, The Derivative as a Function, Product and Quotient Rules, Rates of Change, Higher Derivatives, Trigonometric Functions, The Chain Rule, Implicit Differentiation, Derivatives of General Exponential and Logarithmic.

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: Applications of the Derivatives

Functions, Related Rates, Linear Approximation and Applications, Extreme Values, The Mean Value Theorem and Monotonicity, The Shape of a Graph, L'Hôpital Rule, Graph Sketching and Asymptotes, Applied Optimization, Newton's Method.

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:

Wednesday, Sep 9 – First day of classes.

Class End: Nov 13

Study day: Nov 16

Midterm Exam One: Oct 1

Midterm Exam Two: Oct 29

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 |

BLACKBOARD ULTRA ACCESS:

The course information, assignments, and other information will be posted on Canvas. Real time class, and office hours will be held on **Blackboard Ultra**. To get to your real time class: First Log into Canvas then click on Blackboard Ultra which is a button in the left-hand menu in Canvas, then click on class link.

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:

“Due to COVID-19, and under the directive and mandate of public health officials and the president of Central Washington University, students must adopt face covering protocol before entering any classroom or building at CWU until further notice. Students must also follow the social distancing placement marks in buildings and classrooms. If you do not have a face covering Central Washington University can provide one for you. If you have not yet received your CWU-supplied facial covering, please go the SURC Information Desk. Please do so prior to the start of your first class.”

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.