

MATH 173-002 Calculus II  
FALL 2022 (Sep 21 – Dec 2)

Instructor: Sahadeb Upretee, PhD

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Class Time: MTWR 1:00 - 1:50 PM

Office Hours: MT 10-11:00 am, WR 11 – 12:00 pm or appointment

Office: Samuelson 218J

Classroom: Samuelson 251

Hello! You are welcome to the MATH 173 Calculus II.

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

PRE-REQUISITES: MATH 172 with a grade of C or higher.

COURSE CONTENT: This course covers theory, techniques, and applications of differentiation and integration of the elementary functions. Specifically, we will calculate, interpret, and apply definite and indefinite integrals, and then use integrals to calculate area, volume, surface area, amount of work, and fluid force

COURSE OUTCOMES: At the end of the Math 173 course students will be able to:

- Use the process of antidifferentiation to solve problems.
- Demonstrate an understanding of the definition of a definite integral.
- Use the Fundamental Theorem of Calculus to solve problems.
- Compute antiderivatives using basic antidifferentiation rules.
- Use improper integrals to solve problems.
- Set up definite integrals to represent quantities that are given in context.
- Relate the techniques of integration to the solution of differential equations.

### ***Unit 1: The Definite Integral***

Determining distance traveled from velocity, Riemann Sums, Approximation and Computing area, the Definite Integral, the Indefinite Integral, the Fundamental Theorem of Calculus.

#### ***Learning Outcomes***

The students will be able to:

- Compute the approximate area under the graph of a function using rectangles.
- Compute the exact area under the graph of a function.
- Definite Integral and Signed Area
- Apply the properties of the definite integral
- Evaluate the indefinite integral
- Apply to Fundamental Theorem of Calculus (FTC) to solve the problems

### ***Unit 2: Evaluating Integrals***

Constructing Accurate Graphs of Antiderivatives, the Second Fundamental Theorems of Calculus, Integration by Substitutions, Integration by Parts, Other Options for Finding Algebraic Antiderivatives, Numerical Integration.

#### ***Learning Outcomes***

The students will be able to:

- Apply integration by parts
- Find the area between curves
- Calculate volume by applying integration
- Find the average volume
- Apply mean value theorem for integral
- Evaluate improper integrals
- Find the integration by using numerical methods (Midpoint Rule, Trapezoidal Rule, Simpson's Rule)

### ***Unit 3: Differential Equations & Applications of Integrations***

Introduction to Differential Equations, Qualitative behavior of solutions to DEs, Euler's Method, Separable differential equations, Modeling with differential equations, Population Growth and Logistic Equations. The Method of Partial Fractions, Strategies for Integration, Improper Integrals, Arc Length and Surface Area.

#### ***Learning Outcomes***

The students will be able to:

- Integrate the trigonometric integrals
- Correctly apply Euler's method
- Correctly apply partial fraction methods
- Evaluate the improper integral
- Calculate arc length and surface area

REQUIRED CALCULATOR: A scientific or graphing calculator is required.

#### IMPORTANT DATES:

First Class: Sep 21

Class End: Dec 3

Veteran Day: Nov 11 -No Class

Thanksgiving Break: Nov 23-25 No Class

Study Day: Dec 5

Midterm Exam One: Oct -27

Midterm Exam Two: Nov- 28

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

## 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, it could be nice 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 classroom and closed book.

## COURSE POLICIES

### 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](mailto: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.

**CHANGES:** I reserve the right to amend, adjust, or otherwise modify the syllabus at any time during the course. This syllabus is the best approximation of what students should expect during the course