

COURSE OUTLINE
MT. HOOD COMMUNITY COLLEGE DISTRICT
Gresham, Oregon 97030

* New _____
 * Revised 10/25/2006
 * Review only (no changes) _____
 (Date)

* COURSE TYPE Please check appropriate box:

- Lower Division Collegiate
 Occupational Supplementary
 Occupational Preparatory
 Other Education, Including General Ed & Adult Ed

COURSE TITLE Calculus II: Integral Calculus

COURSE NUMBER MTH252 COURSE CREDIT 4

* Lecture Hours 4 | _____ Lab Hours _____ | _____ Seminar Hours _____ | _____
 Wkly/Term Wkly/Term Wkly/Term

* GRADING STATUS:

- Letter Grade Only
 S/U Only
 Optional
 No Grade

* HEADCOUNT LOADING:

- Yes
 No * Factor _____

Guided Studies Requirement:
 Student must be proficient in:

- Reading (RD90)
 Writing (WR90)
 Mathematics (MTH20)
 Not applicable

For Instruction Office Use Only General Education Category Apply general requirement or distribution to:		
AA _____	AS _____	AS/OT-Bus _____
AAS _____	AGS _____	
VP Approval _____	Date _____	

Sara Williams, Mathematics 10/25/06

1) Prepared by _____ Date _____

2) Approved by Distance Education Admin. _____ Date _____

3) Approved by Department Chair _____ Date _____

4) Approved by Dean _____ Date _____

5) Curriculum Committee _____ Date _____

6) Approved by VP for Student Learning _____ Date _____

* See legend/definition for explanation

COURSE DESCRIPTION: (for catalog)

This is the second course of the calculus sequence covering the concepts, computations, and applications of integral calculus. Functions and integrals will be modeled symbolically, numerically, graphically, and in words. A CAS-capable graphing calculator is required.

PREREQUISITE:

MTH 251 with a C or better

INSTRUCTIONAL MATERIALS REQUIRED OF STUDENT: (text, supplies, etc.)

Text, CAS-capable graphing calculator.

STUDENT LEARNING OUTCOMES:

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

1. **Communicate** effectively (orally and in writing) a problem solving process, results, and conclusions using mathematical terminology and correct mathematical syntax.
2. Apply mathematical reasoning and **modeling** to solve problems arising from the real world. Mathematically model problem situations verbally, numerically, visually, graphically, and/or algebraically.
3. Identify **connections** among verbal, numeric, visual, graphical, and algebraic models.
4. Determine if a solution is reasonable and **verify results**. Also, determine if answers are equivalent: from the textbook, from the calculator, and answers developed by hand.
5. Define and interpret the definite integral as a **limit of Riemann Sums**, including proper summation and function notation.
6. **Estimate** the value of the definite integral using a finite sum and determine if the estimate will be over or under the actual value.
7. **Interpret** definite integrals as total change given a rate of change and recognize when a definite integral is informative in an applied situation.
8. Compute definite integrals and antiderivatives **symbolically**, including applying the **Fundamental Theorem of Calculus**.
9. Represent **antiderivatives graphically or numerically**, given a function represented as a graph or a table.
10. Apply definite integrals in many situations including **solids of revolution**.
11. Answer applied problems involving **position, speed, and acceleration**.
12. Recognize an **improper integral**, and use limits to determine whether it converges or diverges.
13. Find **values of improper integrals**, when they exist, using limits, estimation, and technology.
14. **Compare and contrast** definite integrals, indefinite integrals, and antiderivatives.
15. **Summarize** the main ideas and applications of integral calculus.

GENERAL INSTRUCTIONAL METHODS:

The calculus course emphasizes conceptual understanding, mathematical modeling of real-world applications, multiple representations of a problem (and solutions), appropriate use of technology, and mathematical problem solving. This represents a shift away from technique mastery and algorithmic skills. For students to see mathematics as an integrated whole, the above objectives should be presented in a connected fashion and not treated as discrete topics or concepts as the listing of objectives might suggest.

EVALUATION PROCESS:

Assessment is based on a variety of methods noted below. Assignments will be completed both in and out of class. Assessment of individual working required. A grade of C or better is a prerequisite for Math 253.

- Worksheets/Projects/In-depth application problems
- In-class Individual Exams
- Team Exams

- Writing Assignments/Journals
- Daily Homework
- Attendance
- Teamwork/Participation