

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 III

COURSE NUMBER MTH253 COURSE CREDIT 4

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

4) Approved by Dean _____ Date _____

2) Approved by Distance Education Admin. _____ Date _____

5) Curriculum Committee _____ Date _____

3) Approved by Department Chair _____ Date _____

6) Approved by VP for Student Learning _____ Date _____

* See legend/definition for explanation

COURSE DESCRIPTION: (for catalog)

This is the third course in the calculus sequence covering infinite sequences and series, an introduction to multivariate functions, partial derivatives, integration with multivariate functions, and applications. A CAS-capable graphing calculator is required. A computer laboratory maybe is included.

PREREQUISITE:

MTH 252 with a C or better

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

Text, CAS-capable graphing calculator, access to Maple (or other appropriate software) in computer lab

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. Use **technology** (hand-held and/or computer as appropriate) to support understanding by graphing contour diagrams, 3d graphs, computing numerical data, and doing supporting algebra.
6. Compare and contrast a **sequence**, a sequence of partial sums, a finite series, and an infinite **series**.
7. Determine if an **infinite series converges or diverges** by implementing an appropriate convergence test from the following list: geometric, limit sequence, integral, comparison, ratio, absolute convergence, or alternating series. Describe how the conditions of the tests are met (or not) in a particular case.
8. Use **Taylor Polynomials** and Series to approximate function values.
9. Use the ratio test to determine the **radius of convergence** for a power or Taylor Series and illustrate that interval graphically.
10. Recognize, apply, interpret and evaluate using **multivariable function** notation.
11. Locate ordered triples and describe simple 3d graphs (like $z = x^2 + y^2$) in the **3d rectangular coordinate system**.
12. Create and interpret **contour graphs**.
13. Make **connections** between 3d graphs, cross-sections, free variables, contour graphs, and symbolic representations of 3d functions.
14. Recognize a **linear function** (plane) in 3d, given as a contour diagram, a table, or symbolically. Calculate and interpret the "slopes" of the function.
15. Compute and estimate **partial derivatives** given information as a table, contour diagram, 3d graph, or symbolic representation.
16. Find the **equation of a tangent plane** to a 3d function. Use the equation of the tangent plane to estimate nearby function values.
17. Manipulate, calculate, and interpret **double and triple integrals** in rectangular and polar coordinates.

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.

- Worksheets/Projects/In-depth application problems
- In-class Individual Exams
- Team Exams
- Writing Assignments/Journals
- Daily Homework
- Attendance
- Teamwork/Participation