

**CALCULUS III: MATH 253-01**  
**Fall 2007 Syllabus and Schedule**

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HT 105  
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**Lecture:** MWF 11:00 am – 11:50 am in HT 110

**Course:** The main topics of Calculus III involve the differentiation and integration of many variables. As you may have noticed, life is multidimensional, and so, Calculus III forms the foundation for most, if not all, of the physical sciences in addition to most social sciences.

**Prereqs:** Math 151 and Math 152 (Calculus I and II), or equivalent are prerequisites for this course.

**Objectives:** I hope everyone will hone their mathematical abilities to reason quantitatively, logically, confidently, and eventually correctly. By the end of this course, every passing student should

- ... be able to visualize and sketch parameterized curves. Also, given a sketch or a description of a curve, be able to parameterize curves.
- ... be able to calculate and interpret partial derivatives of functions of many variables.
- ... understand the gradient and the directional derivative and be able to use them in applications such as optimization problems.
- ... understand continuity and differentiability in functions of many variables.
- ... be able to calculate double and triple integrals over non-rectangular regions.
- ... understand vector fields, line integrals and their applications.
- ... be able to parameterize curves and compute line integrals.
- ... be able to use the three fundamental vector calculus theorems (Divergence Theorem, Stokes' Theorem and Green's Theorem) to convert integrals from one form into another.

**Grading:** Your grade is determined by your understanding of mathematics and your ability to communicate this knowledge to me on exams and other assignments.

60% points - Four mid-semester exams (15% each)

20% points - Final exam

20% points - Homework

The following letter grades are guaranteed if you earn the corresponding percentage:

100 ← A → 93 ← A- → 90 ← B+ → 87 ← B → 83 ← B- → 80 ← C+ → 77

77 ← C → 73 ← C- → 70 ← D+ → 67 ← D → 63 ← D- → 60 ← F → 0

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**Note:** The Academic Dishonesty Policy as explained in Scot's Guide will be strictly enforced. Plagiarism could result in the failure of the course and possible suspension from the college. See AAcademic Dishonesty@in Scot's Guide and Planner.

- Exams:** All exams will occur in class on the days listed on the class schedule. There are no makeup exams without prior notification and a valid, documented reason.
- Homework:** Homework will be assigned and collected regularly. I do not accept late assignments. On an assignment, half the points on an assignment will be awarded for completeness while the rest will be given for several randomly selected problems.
- Attendance:** Students are expected to attend all classes. A student missing a class, due to valid reasons, is expected to find out the material discussed in class and make up any work that has been missed. Repeated tardiness or more than three unexcused absences will lower your grade.
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**Your resources: All of the following will help you be successful at calculus**

- Textbook:** We will be using the 11<sup>th</sup> edition of Thomas' Calculus published by Pearson 2006.
- Office Hours:** TR 11:00 am – 12:00 pm. This is time I have set aside especially for you. Office hours are a valuable resource and I hope you take advantage of them early and often. I want to help you learn this material, so do not be shy about seeing me outside of class. If you need to see me at a time other than an office hour, feel free to “drop in” or make an appointment.
- Calculator:** I expect everyone to have at least a scientific calculator. You will **not** be allowed to use calculators on exams. However, there will be assignments where a calculator will help.
- Mathematica:** Mathematica is a Computer Algebra System that will be used both in and out of class. If used properly, it can function as both an interactive textbook and a powerful tool that you can use to explore different concepts.
- Classmates:** Math is not a competitive sport! There are many obvious reasons to work together. Even if you end up helping others most of the time, teaching is one of the best ways to gain a deeper understanding of a subject. Please note that there is a major difference between getting assistance from a classmate and copying. Please be honest.
- Time:** The best way to learn mathematics is to spend time with it. It is your responsibility to come to class each day, and attendance is crucial to success in this course.

Math 253-01 Tentative Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
8/27 Academic Orientation No Classes	Classes Begin	8/29 Coordinate Systems Vectors		8/31 Vectors Dot Product
9/3 Orthogonality Cross Product		9/5 Lines Planes		9/7 Surfaces
9/10 Problem Session		9/12 Vector Functions		9/14 Vector Derivatives Vector Integrals
9/17 Projectile Motion		9/19 Exam 1		9/21 Arc Length Curvature
9/24 Curvature Frenet Frame		9/26 Functions of Several Variables		9/28 Limits & Continuity
10/1 Partial Derivatives		10/3 Problem Session		10/5 Chain Rules
10/8 Directional Derivative Gradient Vector		10/10 Tangent Planes Linear Approximation		10/12 Exam 2
10/15 Fall Break No Classes	Fall Break No Classes	10/17 Extreme Values		10/19 Extreme Values
10/22 Double Integrals over Rectangles		10/24 Double Integrals		10/26 Double Integrals Applications
10/29 Change of Variables: Polar Coordinates		10/31 Triple Integrals		11/2 Problem Session
11/5 Exam 3		11/7 Cylindrical and Spherical Coordinates		11/9 Change of Variables: Spherical Coordinates
11/12 Line Integrals		11/14 Vector Fields		11/16 FTC for Line Integrals
11/19 Green's Theorem		11/21 Thanksgiving No Classes	Thanksgiving No Classes	11/23 Thanksgiving No Classes
11/26 Curl & Divergence		11/28 Problem Session		11/30 Exam 4
12/3 Surface Integrals		12/5 Parametric Surfaces		12/7 Stokes' Theorem
12/10 Divergence Theorem		12/12 Course Review	Reading Day No Classes	Finals Week
Finals Week	12/18 Final Exam 1pm-4pm	Finals Week	Finals Week	Finals Week