

# Calculus and Analytic Geometry III

Math 321-A

Spring, 2006

## Course Description:

This course provides a study of advanced techniques of differential and integral calculus, including plane curves and polar coordinates, three-dimensional analytic geometry including vectors, differentiation and integration of multivariable functions, and applications. A specific graphing calculator is required. Prerequisite: MTH 221.

**Instructor:** Jeff Clark

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**Office Hours:** MWF 9:30–10:30 AM, TTh 1:00–2:00 PM

## Required Materials:

1. *Calculus* by Stewart (fifth edition).
2. TI-89 calculator from Texas Instruments.

## Course Goals:

This course will explore the following topics:

- Conic sections
- Parametric equations
- Polar coordinates
- Vectors
- Multivariable functions
- Partial derivatives
- Multiple integrals

The course will focus on the necessary writing and technology skills that relate to these topics.

## Course Objectives:

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

- Understand how conic sections behave, and their use in astronomy.
- Be able to compute with and manipulate functions of more than one variable.
- Understand the relations between the various rates of change in multivariable functions.
- Understand the use of multiple integrals for computing measures of area, volume, mass, etc.

**Course Content:**

- Conic sections
- Parametric equations
- Polar coordinates
- Vectors
- Surfaces
- Cylindrical coordinates
- Velocity
- Acceleration
- Tangent and normal vectors
- Arc length and curvature
- Partial derivatives
- Gradients
- Tangent planes
- Extrema
- Iterated integrals
- Vector fields
- Line and Curve integrals
- Green's Theorem

**Feedback and Evaluation:**

1. Weekly problem sets will be worth 20% of your final grade.
2. There will be three projects, each worth 10% of your final grade.
3. There will be three exams, each worth 10% of your final grade.
4. The final exam will be cumulative and will be worth 20% of your final grade.

5. I grade on a ten-point scale:

93–100	A
90–92	A-
87–89	B+
83–86	B
80–82	B-
77–79	C+
73–76	C
70–72	C-
67–69	D+
63–66	D
60–62	D-
0–59	F

**Honor Code**

All Elon University students are expected to adhere to the university's Honor Code:

[http://www.elon.edu/students/handbook/aca\\_honcode.asp](http://www.elon.edu/students/handbook/aca_honcode.asp)

For our class, that specifically requires:

- That you do not claim other people's work as your own. You certainly should not copy the work of other students, be it inside or outside of the classroom.

- That you speak and write truthfully.
- That you express your opinions with civility and respect for those around you.

These requirements should not be new to you; they reflect common courtesy in a university setting.

### Schedule

Date	Reading	Exam
Week of January 30	11.1–11.4	
Week of February 6	11.5, 11.6, 13.1, 13.2	Exam #1, Thursday, March 2
Week of February 13	13.3–13.5	
Week of February 20	13.6–13.7	
Week of February 27	14.1–14.2	
Week of March 6	14.3, 14.4, 15.1	Project #1 due on Tuesday, March 14
Week of March 13	15.2–15.3	
Week of March 27	15.4–15.5	
Week of April 3	15.6–15.7	Exam #2 on Thursday, April 6 Project #2 due on Friday, April 14
Week of April 10	16.1–16.3	
Week of April 17	16.4–16.6	
Week of April 24	16.7–16.9, 17.1	
Week of May 1	17.2–17.6	Exam #3 on Thursday, May 4 Project #3 due on Friday, May 5
Week of May 8	17.7	
		Final Exam, Thursday, May 11, 3:00–6:00