

Calculus and Analytic Geometry III

Math 321-A

Spring, 2003

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 graphing calculator is required. Prerequisite: MTH 221. Offered fall and spring.

Class Time: MF 9:20–10:15 AM, TTh 10:30–11:50 AM

Instructor: Jeff Clark

Office: Duke 201-A

Phone: x6248 (278-6248 from off campus)

E-Mail: clarkj (clarkj@elon.edu from off campus)

Web Page: <http://frodo.elon.edu>

Office Hours: Mondays and Wednesdays, 2:00–3:00 PM; Tuesdays and Thursdays, 2:30–3:30 PM; Fridays, 1:00–2:00 PM

Required Materials:

1. *Calculus* by Larson, Hostetler, and Edwards.
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
- Divergence Theorem
- Stokes' 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/acahoncode.asp>

For our class, that specifically requires:

- That you do not claim other people's work as your own. *You must cite explicitly the work that you use, whether it be by the author of a text or a classmate.* (You need not cite me or our text.)
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.

I will report any violations to the Office of Academic Affairs for prosecution.

Schedule

Date	Reading	Exam
Week of February 3	9.1–9.4	
Week of February 10	9.5, 9.6, 10.1, 10.2	
Week of February 17	10.3–10.5	
Week of February 24	10.6–10.7	Exam #1 on 2/28
Week of March 3	11.1–11.3	Proj. #1 on 3/7
Week of March 10	11.4, 11.5, 12.1	
Week of March 17	12.2–12.4	
Week of March 31	12.5–12.7	
Week of April 7	12.8–12.9	Exam #2 on 4/11
Week of April 14	13.1–13.3	Proj. #2 on 4/18
Week of April 21	13.4–13.6	
Week of April 28	13.7, 13.8, 14.1	
Week of May 5	14.2–14.4	Proj. #3 on 5/9
Week of May 12	14.5–14.7	Exam #3 on 5/12
Friday, May 16	8:00–11:00	Final Exam