

Mathematics 211
Fall, 2003

Instructor: Dr. Michael Rogers.

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LearnLink: "Michael Rogers" (no middle initial).

Hours: **MWF 11–12, MWThF 2–3 p.m.** and even later; also by appt.

Course Content: Mathematics 211 is the third semester of calculus. It revisits and adapts the concepts from first-year calculus in the setting of three-dimensional space. The main topics are geometry in space; vectors; functions of more than one variable including vector fields; the limits, differentiation, and integration of such functions; and applications.

Textbook:

- Colley, *Vector Calculus*, 2nd ed., Prentice-Hall.

Course Goals: After this course, you should be able to do the following: to sketch three-dimensional graphs, to understand how the calculus of single-variable functions generalizes to multivariable functions, to evaluate limits of multivariable functions, to differentiate multivariable functions and vector fields, to integrate multivariable functions and vector fields, to discuss the roles of these processes of multivariable calculus in solving problems, to understand better the material of first-year calculus.

Classes: You are responsible for work covered in class. Furthermore you are expected to have done the reading for each class. Your ability to get the most out of each class is greatly diminished by a failure to be prepared.

Evaluation: Grades will be based on the following written work:

Tests (3 @ 100 pts)	300 points
Problem Sets (100, 150, 250 pts)	500 points
Homework	100 points
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Total	900 points

The plus/minus system will be used. A rough guide to grades: A: ≥ 800 pts. B: 700–800 pts. C: 600–700 pts. D: 500–600 pts. F: < 500 pts.

Tests: There are three out-of-class, self-scheduled, closed-book, timed tests, each worth 100 points. If a student has an excuse deemed legitimate by the instructor, arrangements will be made to take the test **prior to** the scheduled time.

Problem Sets: There are two midterm problems sets and a final problem set. The problem sets are take-home and open-book, but they are to be worked on one's own. A midterm problem set will be handed out before each of the first two tests and due after it; at least a week will be allowed. During that time, the student is expected to keep up with the regular class work. The final problem set takes the place of a final examination. The problem sets are cumulative, increase in value, and are worth 100, 150, and 250 points respectively.

Homework: Assignments from the text and those created by the instructor will be given; these assignments will be collected and graded. **The purpose of calculation is insight** (Gauss).

It is the instructor's opinion that this course is about as hard as first year calculus with this important qualification: If you enrolled in a college-level calculus course with no previous calculus experience, then this course will require about as much work. If you "coasted" through calculus, this course will be different. Almost no one will have any familiarity with the new concepts in this course, except in as much as they resemble those from single-variable calculus.

A routine exercise in multivariable calculus tends to take more time than one in single-variable calculus. Therefore it will not be possible to practice with the same level of repetition as in Math 111/112. Instead, the student must probe each exercise deeply. Take time to reflect on each problem as you complete it. The students

Calculators: Calculators which do not differentiate, integrate, nor perform algebraic manipulations may be used to assist the student with any assignment or examination, provided that the solutions are carried out in exact, rather than approximate, form (e.g., π rather than 3.14, $10/\sqrt{3}$ but not 5.77). In general calculators are not recommended for the in-class tests.

Use Good Style: Thoughts are expressed by sentences: just so in mathematics. **Written work must be in complete sentences.** The same applies to daily homework. See Priestley, "Clean Writing in Mathematics," pp. 413–420 in *Calculus: An Historical Approach*.

Honor Code: The Honor Code of Oxford College applies to all work submitted for credit in this course. To receive credit for work submitted you must place your name on it. By placing your name on such work, you pledge that the work has been done in accordance with the given instructions and that you have witnessed no Honor Code violations in the conduct of the assignment.