

Course Head: Peter M. Garfield
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Science Center 422
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Office Hours:
Mondays: 2:30 PM – 3:30 PM
Tuesdays: 1:30 PM – 2:30 PM
Or by appointment

Web Page: <http://www.courses.fas.harvard.edu/~math21a/>

Text: *Multivariable Calculus: Concepts & Contexts 3e*, by Stewart (ISBN 0-534-41004-9)

Be careful as there are versions that are single variable only or both single and multivariable. Our version has only chapters 8 through 13, but the version with all 13 chapters is also acceptable.

Course Meetings: This course offers lectures at a selection of times, which may include MWF 9 AM, MWF 10 AM, MWF 11 AM, MWF 12 Noon, TTh 10:00–11:30 AM, and TTh 11:30–1:00 PM. You are required to section for the course and choose a particular section. We teach this course in sections rather than in a large lecture to allow you to get more involved and to ask questions during lecture.

Course Content: This course extends single variable calculus to higher dimensions. We develop a vocabulary for understanding fundamental equations governing natural phenomena such as weather, planetary motion, waves, heat, and quantum mechanics. The course also provides important background needed for future study in statistics, computer science, bioinformatics, finance, epidemiology, and much more. You will learn tools to describe curves, surfaces, solids and other geometrical objects in three dimensions and develop methods for solving optimization problems with and without constraints. The course prepares you for advanced study in other fields of mathematics and their applications. Furthermore, it deepens your abstract thinking, and sharpens your problem-solving, visualization, and computing skills.

Homework: The best advice for any math student is to solve problems – doing the assigned homework is the best way to learn the material. Put another way: the homework is the most important part of the course. Problem sets will be collected every day on the previous class's material. Homework is due at the beginning of section every day; no late homework will be accepted. Instead, your three lowest homework scores will be dropped in calculating your homework score.

I would encourage you to work with other students in the class. You will learn the material faster and understand it better by discussing it with your peers. Any work you turn in, however, must be your understanding of a solution in your own words.

Labs: Modern computer algebra systems like Mathematica are incredibly powerful and are an important computational and visualization tool. To encourage you to become familiar with these systems, we will have occasional lab assignments in addition to the regular homework. These will not be too time-intensive but will constitute 5% of your course grade.

Math Question Center (MQC): The Math question center (MQC) is open Sundays through Thursdays, from 8:30 PM – 10:30 PM (with occasional holiday closures). This semester the MQC for Math21a is in Science Center 309.

General Exam Information: The point of an exam is to prove to the grader that you know how to solve the problems asked. Thus the final answer is *not* the most important part of the exam; rather it is the work or reasoning behind the answer. You should show your work or explain your thinking in order to receive full credit.

Exams: There will be two midterm exams, scheduled for 7:00–9:00 PM on Thursday March 5th (in Science Center Hall D) and Tuesday April 7th (in Science Center Hall C). The final exam will be on Monday May 18th at a time to be announced. No calculators or notes are permitted during exams.

Grading: Each exam is worth 20% of the course grade and the final exam is worth 30%. The remaining 30% will be derived from the homework (25%) and labs (5%). We will have the following *resurrection policy*: your lower exam score will be replaced by your final exam percentage, if this is to your advantage. Thus your final exam could constitute up to 50% of your final course grade.