

MATH 120: MULTIVARIABLE CALCULUS SUMMER 2022

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1. COURSE DESCRIPTION

In Math 120 we study the geometry and calculus of three-dimensional objects (and sometimes higher dimensional!). Some of the topics include: the vector geometry of three dimensions, scalar and vector functions of one and two variables, partial derivatives, directional derivatives, multiple integrals, cylindrical and spherical coordinates, parameterized curves and surfaces, gradient, divergence, curl, line and surface integrals, and the theorems of Gauss, Green, and Stokes.

2. MATERIALS

We will be using James Stewart's *Multivariable Calculus and Early Transcendentals*, 8th edition, Cengage learning. Note that this is *not* the latest edition of the book. Either the e-book or paper copy is fine; if you're unable to obtain a copy for whatever reason, feel free to send me an email and we'll work it out.

3. PREREQUISITES

Familiarity with integral calculus at the level of Math 115 or equivalent. The problems listed at [this page](#)¹ are an example of the kind of problems you should be comfortable solving.

4. STRUCTURE

This course has four mandatory components counting toward your final grade:

¹Except for the last two sections on power series and complex numbers.

4.1. **Class.** Class attendance is mandatory, and active participation is encouraged. Because of your pre-class work (see below), class time is designed to be largely interactive and focused on solving problems in a collaborative setting.

4.2. **Pre-class Work.** There will be some combination of *readings* and *videos*, and a short *quiz*, assigned for each class day. Quizzes are due at 11:59PM the day before each class. You will have up to six attempts to submit your quiz answers, and your highest score will be recorded.

Only the quizzes are counted toward your grade, but you are highly encouraged to make time for the readings and videos. The intent of this pre-class work is to expose you to basic concepts and skills, and to get you thinking about the material in advance. Not only will this prepare you to better absorb and retain class material, it will also free up time for the class to be more hands-on.

4.3. **Homework.** There will be two homework assignment due each week, at 11:59PM on Tuesdays and Fridays.

Though you are allowed to use your notes and calculator, you are encouraged to attempt the homework without, so as to better prepare for exam conditions.

There may be times on the homework where you encounter a tricky integral, and it is ok to look those up. Note that, on exams, you are responsible for the u-substitution and by-parts integration techniques, as well as basic trig integrals (but not trigonometric substitution).

You are more than welcome to discuss the problems with your friends and classmates. However, you must write up and submit your own solutions to the problems. Be sure to show your own work to each problem. Copying answers is academic dishonesty, and all such cases will be handled appropriately.

4.4. **Exams.** There will be three 90-minute non-cumulative written exams, administered during class time. Tentative dates are the following:

- Friday, July 15
- Wednesday, July 27
- Friday, August 5

Math-related external materials (notes, calculator, etc.) are not allowed.

In addition to the above mandatory components, there are some extra resources. These are not mandatory and do not count toward your grade.

4.5. **Office Hours.** I will hold regularly scheduled office hours. Feel free to drop by at any time for any questions you have.

4.6. **Ximera.** Ximera is a free online resource that hosts a series of modules, one for each section of the book. Each module contains a recap video, an example video and lots of problems.

4.7. **Summer Session Tutoring.** Summer session tutoring information will be available in late June at [this page](#).

5. GRADING

Your grade will be determined as follows:

- Quizzes 5%
- Class participation 5%
- Homework 15%
- Exam 1 25%
- Exam 2 25%
- Exam 3 25%

We have the following guaranteed cutoffs:

Cutoff	≥ 90	≥ 80	≥ 65	≥ 50	≥ 0
Grade	A/A-	B+/B/B-	C+/C/C-	D	F

What this means is if you get a 91% at the end, then you are guaranteed an A- in the class, regardless of how the rest of the class fares. However, we can move the cutoffs down if the grade distribution is too low. All this is to say that a curve can only help you at the end, it can't hurt you (we won't curve down).

6. MISSED OR LATE WORK

It is possible you will miss coursework because of illness, a family emergency, or certain university-approved reasons (such as athletics). If you provide adequate documentation, I can provide you with an extension or excuse the work as is appropriate for the situation. Work missed for other reasons will not be excused.

7. ACADEMIC INTEGRITY

At Yale, academic honesty is taken very seriously. Please take a moment to read the above homework and exam policies in Math 120, so that you can be sure to follow them. In particular, the use of calculators, notes, books, or any other aid on our exams is forbidden.