

Math 120, Fall 2017

Course syllabus

Course Description

In Math 120 we study the vector geometry of 3 dimensions, scalar and vector functions of 1 and 2 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.

Section placement

Before you enroll in Math 120, you must do two things:

1. Place into the course, by passing Math 115 or 116 at Yale, or through the math placement exam. For details, see <http://math.yale.edu/undergrad/placement-exam>. Without placement into the course, you may not enroll, and your section assignment will not be honored even if you enter the lottery.
2. Enter section lottery. The lottery closes at 5pm on Monday, August 28. Your assigned section will be listed on the lottery page a few hours after the lottery closes. As of this Fall, the correct section should automatically appear on OCS after the lottery. It's our first time trying this – to be safe, please check your assignment on the lottery site as well (if they differ, lottery site is the correct one).

If you miss the lottery, or need to switch sections, you will be able to add yourself to our online waitlist. A link to the waitlist will be posted on the main course site once lottery results are released.

We expect most sections to be full initially, so please do not attend your waitlisted section(s) unless you hear from the instructor that a spot was found for you.

Moving to Math 115

If you find that you are behind in Math 120 due to insufficient single variable calculus preparation, it may be possible for you to move to Math 115. You must consult with your Math 120 instructor to see whether this is a reasonable option. If you find yourself considering it, we encourage you to bring it up as soon as possible, so that you may get the most of Math 115 should you end up taking it. The very last day when such a switch would be permitted is Midterm.

Text

The text is James Stewart's *Multivariable Calculus Early Transcendentals, Math 120*, eighth edition, Thompson. The eighth edition is new as summer 2015. Earlier editions differ in some sections and most homework exercises.

Class website

There are two Math 120 sites on Canvas. "Math 120 MAIN" is common to all the sections, and contains information that's the same for everyone: syllabus, homework, links to resources, practice exams, etc. It will also have all course announcements, such as information about upcoming exams.

The second site is labeled with the section number. It has your instructor's contact information, office hours, homework assignments and scores, and other section-specific information.

Homework

Homework assignments will be posted on Thursdays (TuTh sections) or Fridays (MWF sections) on your section website. Each assignment will represent topics covered that same week in class. It will be due the following Thursday / Friday in class. Be sure to get the assignment from your section site, under "Assignments" (rather than looking at the recommended exercises on the main course site).

Feel free to discuss the assignments with your classmates, but **you must write up and submit your own set of solutions. Make sure to show your work: answers must be fully justified and all relevant calculations shown.** The homework totals vary with the number of problems, but each homework contributes the same amount to the final homework score. In other words, we will be adding homework percentages, not the total number of points.

Late homework will be accepted only if accompanied by a Dean's excuse. We do understand that the semester can get busy, and we will drop your lowest homework score. If you miss a homework altogether, we strongly recommend that you do the exercises later for your own practice, as the topics may be tested on exams.

Homework presentation

It is important to be able to communicate mathematics effectively, especially when you are using it as a tool for application in other disciplines. In simple homework computations, you should show and justify the key steps; in more open-ended or longer homework problems, you need to explain your thinking clearly. Your homework should be presented in a professional manner. In particular:

- Staple all pages together.
- Submit questions in the order that they were assigned.
- State your final answer clearly.
- Leave space for comments from the grader.

Exams

Exam 1 will take place on Thursday, October 5, and Exam 2 on Thursday, November 16. **Both midterm exams are in the evening, 7:30 - 9pm.** The final exam will be scheduled by the Registrar. At the moment, it looks like the final will be 9am – 12:30pm on Saturday, December 16.

Makeup exams will only be given with a Dean's excuse.

The exams are closed book: **no calculators, notes, books, or other forms of aid are allowed.** We will give you double angle formulas, for integrating $\sin^2(x)$ and $\cos^2(x)$. Examples of functions you should know how to integrate on exams include sin, cos, exp, polynomials. You should also be able to use simple substitution to integrate functions such as $\sin(x) / \cos^3(x)$, or $x \cdot \exp(x^2)$.

Practice exams and detailed information about each test are posted on the course webpage, and a list of review sessions will be added before each exam.

Writing up solutions

We expect you to justify your answers to homework and exam problems: correct reasoning is more important than the final answer. Correct answers without work will receive little or no credit. A guide to writing up Math 120 solutions is posted on the course website – make sure to read it, so that you do not unnecessarily lose credit.

Calculators

The use of calculators is not permitted on exams. On the homework, you may use a calculator, a computer, or a table of integrals – indeed you will see some functions difficult to integrate otherwise. We recommend that you do not rely on these to the extent that you lose fluency with the material and do not develop your own computational skills. We will make sure that problems on exams require only a moderate amount of computation, so that you can spend most of your time demonstrating your mathematical knowledge.

Evaluation

Course grades are determined from the combined total of homework scores, two midterm scores, and the final exam score. There are two possible formulas for combining these scores: the first puts 50% weight on the midterms, and the second allows some of the midterm weight to be transferred to the final (allowing you, in a sense, to make up a part of your midterm score by showing your knowledge on the cumulative final exam).

Midterm score: 50% exam 1, 50% exam 2

Formula 1: 10% homework, 50% midterm score, 40% final exam

Formula 2: 10% homework, 40% midterm score, 50% final exam

The formula more beneficial to your grade will automatically be selected when we calculate your total score.

The total score will be translated into a letter grade using cutoffs shown below. We will not round the totals to the nearest integer; you must actually get to 90% or above to get an A-, 89.9% will not suffice.

The class is curved in the following sense: if the given cutoffs create a grade distribution that is too low, we will move them down so as to make grading more generous. We will not move the cutoffs upward; that is, if you get 91% (say), then you are guaranteed at least an A- in the course, regardless of other students' scores.

We do not have a final-trumps-all policy. Formula 2 allows your final exam to take some weight away from your midterms. We will not replace all of your scores with the final exam.

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

Academic honesty

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.**

As an extra note, please do not make any notes into returned examinations. Should you need to ask for re-grading of your exam, the test must be submitted to us exactly the way it was. Any alteration, however innocent, is considered to be dishonest by the University.

If you have any questions about our policies, please feel free to ask your instructor, they will be happy to answer them for you.

Places to get help:

Office hours

Your instructors will hold office hours during the week. Stop by with any questions about the topics, homework, or any confusion about the material. If you can't make the regular office hours, e-mail your instructor to find another time to meet.

Peer tutors

Peer tutors are undergraduate tutors assigned specifically to Math 120. They have regular office hours, and are also available for private appointments that you can request by e-mail. Their office hours and contact information will be posted on the course website at the end of shopping period.

Residential college tutors

Each college has math and science tutors who hold regular office hours to help with a series of courses, including Math 120. Unlike peer tutors, each college tutor covers several courses, so you may have to listen for a bit to questions about other classes when you attend their office hours. The schedule is at

<http://yalecollege.yale.edu/content/tutoring-and-academic-support>

Note: You can attend tutor office hours at any college, not just your own.

Coaches

After the first exam, graduate student TAs will start running weekly small group sessions with students who could benefit from some additional help with the course. If you feel that you are struggling with the course, talk to your instructor, and you can start the coaching program early. More information is available on the class website, under "Getting help".

Private tutors

Private tutors are available for students who are in danger of getting a C+ or lower in the course. To request a private tutor, talk to your instructor (the math department assigns its own private tutors for calculus, so the requests don't go through college Deans as usual).

Calculus tutorials

If you are feeling a bit rusty with your single variable calculus, take a look at our calculus tutorials. They contain notes and practice problems with solutions for the entire content of Math 112 and Math 115, and should be helpful if you need to refresh your memory on some of the topics, or if your previous course did not cover everything needed for Math 120. A link to the tutorials is provided on the front page of the main course site.

Note: If you are having trouble with the homework or with any of the topics, do not wait to get help. Attend office hours, or see one of the peer tutors. A few questions right away can save you hours of work later on, and prevent you from falling further behind. If you miss some classes or fall behind for any reason, see your instructor as soon as possible, and they will help you find a way to catch up.

Math 120, Fall 2017 schedule

Week	Mon date	Sections*	MON	TUE	WED	THU	FRI	
1	Aug 28	12.1-12.5	Calculus advising	No classes	Classes start			
2	Sept 4		Labor day					
3	Sept 11	13.1-13.4, 14.1						
4	Sept 18	14.2, 14.3, 14.5						
5	Sept 25	14.6, 14.7						
6	Oct 2	14.8, 15.1, 15.2				Exam 1 7:30pm		
7	Oct 9	15.3, 16.1, 16.2						
8	Oct 16	16.2			October recess			
9	Oct 23	16.3, 16.4					Mid-term**	
10	Oct 30	16.4, 16.5						
11	Nov 6	16.6, 16.7						
12	Nov 13	16.8				Exam 2 7:30pm		
13	Nov 20		November recess					
14	Nov 27	15.6, 15.7, 15.8						
15	Dec 4	16.9					Classes end	
	Dec 11		Reading period					

*Detailed description of what parts of each section we cover is posted on the class website, under "Topics".

**The last day to leave the course without a W on the transcript, and the last day to move to Math 115.