Math 120 Fall 2019 Syllabus

Contents

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 Enrolling in Math 120

To enroll in Math 120, you must complete two tasks:

(1) Make sure you have placed into 120. This could be done in the two ways: passing Math 115 or Math 116 here at Yale, or by placing in via the placement exam. **Without placement in the class you may not enroll, and any section assignment you receive through the lottery will not be honored.**

(2) Enter the section lottery. The lottery will close on Monday, August 26th, at 5pm. Your assigned section will be listed on the lottery page a few hours after the lottery closes. **Note that the section assignments are not linked to OCS. You are responsible for adding your assigned section to your schedule.**

3 Waitlist

If you missed the lottery or need to switch sections, you may enter our online waitlist. The link to the waitlist will be posted on the main canvas page once the lottery results are released. **Please note that putting your name on the waitlist does not guarantee you a space in your desired section, and due to limited space we ask that you do not attend your waitlisted section until the instructor says they have a spot for you.**

4 Moving to Math 115

If you find that you are having trouble in Math 120 due to insufficient single variable calculus preparation, it may be possible to move down to Math 115. You will have to consult with your instructor before doing so, and we recommend that in the event you do want to move down that you talk with your instructor as soon as possible. This is to ensure that you get the most out of moving to Math 115. Note that the last day to move to Math 115 is Midterm, which this semester will be on October 25th.

5 Textbook

The textbook for this course will be James Stewart's Multivariable Calculus Early Transcendentals, 8th edition, Thompson.

Important to note here: Earlier editions will differ in some sections and exercises. Also note

that the book should say "Early Transcendentals." There is a version of the textbook without this designation, and that will also differ in some sections and exercises.

6 Class Website

There will be two Math 120 Canvas sites. The first is the "Main Math 120 Page," and this page will be common to all sections. Here, we will post the syllabus, practice problems, practice exams, etc. We will also be posting course announcements which concern the whole course, such as exam information.

The second site will be the section canvas site, specific to a particular section of the course. Here, you will find your instructor's office location, office hours, homework assignments, homework scores, and anything else specific to the section. It will be important to check each of the two sites regularly so you get all the important information and resources.

7 Homework

There will be one homework assignment due each week, with the first one due at the end of week 2. This will be your time to practice the concepts covered in the lectures, and so you should treat the assignments as such. You should attempt to do the problems without calculators or notes so that you get the most out of the homework. 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).

In addition, at the end of the first week of class, there will be a required Ximera module on projections, a topic we will not be covering during lecture. More will be said about this both in class and via course announcements.

7.1 When is the homework due?

Homework will be due either Thursday (for TTh sections) or Friday (for MWF sections) in class. Each homework assignment will be posted a week before the due date on the section-specific canvas site (see above). **Late homeworks are not accepted without a dean's excuse.**

7.2 How much is homework worth?

The homework collectively will count for 10% of the total grade in the course. This means you should not feel too much pressure on each assignment, and really use the homework as practice rather than assessment. We understand that your semesters will get busy, particularly around exam time, so **your lowest homework score will be dropped.** However, note that there will be homeworks due even on the weeks of exams.

The homework assignments themselves may vary in the number of total points (it is always 10 points/problem), but you should note that we average the homework percentages at the end, so each homework assignment counts the same towards your homework grade.

7.3 How should homework be presented?

When writing out the solution to a homework problem, you should be trying to communicate to the grader that you understand each of the steps being taken. In simple computational problems, this means you should show and justify each step (only minor justification needed). In some of the longer homework problems, you should be writing a bit more and explaining everything clearly.

Moreover, when you hand it in, it should be looking neat and professional. This means:

- Your homework must be stapled.
- Your name and section number must be clearly written on the top. If the grader cannot read this information, then they cannot input the grade, so this is very important.
- Clearly state your final answer to each problem (circling it can help).
- Leave a little space between problems for the grader to write comments.

7.4 Can I work with friends on the homework?

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.

8 Exams

There will be two exams plus a final exam this semester.

8.1 When and where are the exams?

Exam 1 is going to take place on Thursday, October 3rd from 7-8:30pm. Exam 2 will be Thursday, November 14th, also from 7-8:30pm. Exam locations will be announced closer to the exam dates.

The final exam is tentatively scheduled for Sunday, December 15th, from 7-10:30 pm.

8.2 Can I use a calculator on the exams?

There are **no calculators, notes, books, etc. allowed on the exams**.

8.3 Will there be practice exams provided before the exams?

Yes, before the exams, we will post old exams as well as additional practice problems. Please note that you should not view the old exams as carbon copies of what will appear on the exams. They were given in past semesters by different instructors. You should use them as practice and as a resource in case you wanted to time yourself on the exam to make sure you can do the problems in the allotted time.

8.4 How much are the exams worth?

See the next section on grades.

8.5 If I miss the exam, is there a makeup exam?

The following is very important: **Makeup exams will only be administered with a dean's excuse.** If you are unable to take the test for any reason, you must see your Dean in advance of the exam and obtain permission to take the makeup.

9 Grading

Your grade in the course will be determined by your homework score, exam scores, and final exam score.

9.1 What is the grading scheme?

There are two possible grading schemes for the course. One weights your final exam score a bit more, but we do not have a final-trumps-all policy. The two schemes work as follows: first, your midterm score is 50% of midterm 1 and 50% of midterm 2. The two formulas are then:

- **Scheme 1**: 10% homework, 50% midterm score, 40% final exam.
- **Scheme 2**: 10% homework, 40% midterm score, 50% final exam.

You do not need to tell us what scheme you want to use. We will automatically take the higher of the two scores at the end of the course.

9.2 Is the class curved?

The class is curved in some sense. At the end of the course, the higher of the two schemes above will be your raw percentage in the class. We have the following guaranteed cutoffs below:

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 of the course from the higher of the two grading schemes, 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).

10 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 help.

11 Extra Resources

Suppose you have questions about the material in the course. We have several resources that we encourage you to take advantage of.

11.1 Office Hours

Your instructor will be having regularly scheduled office hours. This is a great place to go for any questions you have. If you can't make the scheduled hours, email your instructor and ask about meeting at a separate time.

11.2 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 main canvas website at the end of shopping period.

11.3 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.

11.4 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.

11.5 Coaches and private tutors

Students who could benefit from additional help with the class may be eligible for a spot in the coaching program or a private tutor. Availability is limited, and preference is given to students with lower scores. Typically, it is not possible to include students who are getting an A or a B in the class, and we invite them to make full use of the resources mentioned above: instructor office hours, peer tutors, and residential college tutors.

In the coaching program, math graduate student TA's run weekly small group sessions. Each group consists of six students who will meet with their coach once a week for an hour. The coach will have prepared a variety of activities and thought exercises to help students gain better understanding of the material.

Private tutors for calculus are assigned through the math department, rather than through the CTL. Your instructor can request a tutor directly by e-mail to our faculty member who assigns

them. Usually it takes between a few hours and a few days to get a tutor, depending on tutor availability.

11.6 Ximera

On Ximera, there is a series of modules, one for each section of the book. Each has a recap video, an example video, and lots of problems. Additionally, there are modules giving practice problems for the midterm. This is a free online resource, and more will be said about this in class and via course announcements.

12 Tentative Schedule of Topics

Week	Mon. Date	Sections	M	T	W	Th	F
1	8/26	12.1-12.3	Calculus Advising	No Class	Classes Start		
2	9/2	12.3-12.5	No Class: Labor Day				
3	9/9	13.1-13.4, 14.1					
4	9/16	14.3, 14.5 14.6					
5	9/23	14.7					
6	9/30	14.8, 15.1, 15.2				Exam 1 7-8:30pm	
7	10/7	15.3, 16.1, 16.2					
8	10/14	16.2			No class: October Recess	No class	No class
9	10/21	16.3, 16.4					Midterm
10	10/28	16.4, 16.5, 16.6					
11	11/4	16.6,16.7					
12	11/11	16.8				Exam 2, 7-8:30 pm	
13	11/18	15.6-15.8					
14	11/25	N/A	No class: November Recess	No class	No class	No class	No class
15	12/2	16.9					Last day of class