

MAT 127: Calculus C, L02, Spring 2015

Additional Course Information

About the Course

MAT 127 is the final part of the three-part one-variable calculus sequence MAT 125-126-127, but is fundamentally different from and significant harder than MAT 123, 125, and 126. MAT 127 is more like a 200-level, perhaps harder than MAT 200 or MAT 211. The enrollment in MAT 127 is roughly 1/5 of the enrollments in MAT 125 and 126 separately and includes a number of freshmen who did not take MAT 125/126 at Stony Brook. So at most 1/6 or so of the students in MAT 125/126 continue on to MAT 127, and these 1/6 likely tend toward those students who get A/B in MAT 125/126, not C. This all means that you should expect a *significantly* lower grade in MAT 127 than you got in MAT 126 if you put in a similar effort.

In order to take MAT 127, you must have either completed MAT 126 with a grade of *C* or higher or achieved at least level 8 on the Mathematics Placement Examination. Furthermore, you must have *solid* understanding of the topics covered in MAT 123, 125, and 126. It is almost certainly the case that you have met the first, formal, requirement to take MAT 127. One reason why MAT 127 is much harder than MAT 125/126 is that you must meet the second requirement as well in order to have a reasonable chance of passing MAT 127. You may have gotten a C in MAT 126 because the class was “curved” and there were enough other students who did worse than you. If this is the case, you are almost certainly not ready for MAT 127 and are at a significant risk of failing this course. Even if you got an A/B in MAT 126, there may be things from MAT 123/125/126 that you have forgotten, especially after a 1.5-month break (or longer). Since it is not feasible to review much of MAT 123/125/126 in class, it is your responsibility to ensure that you have a firm grasp of the material covered in MAT 123/125/126, in particular

Chapter	1	2	3	4	5	Appendixes
Sections	3,5,6	2-8	1-7	3,5,8	1-6,10	A,B,C,F,G,I

Table 1: Some of the sections from the textbook to review at the beginning of the semester.

If you do not have a firm grasp of the above material, your grade in MAT 127 is likely to be *significantly* lower than in MAT 126. It is not uncommon for students signing up for this course to think that

$$\frac{1}{x \pm y} = \frac{1}{x} \pm \frac{1}{y}, \quad e^{x \pm y} = e^x \pm e^y, \quad \ln(x \pm y) = \ln x \pm \ln y, \quad \sin(x \pm y) = \sin(x) \pm \sin(y), \quad \text{etc.}$$

ALL of these **ARE WRONG**. You should have learned in junior high that these cannot be right (the only continuous function satisfying these properties is $f(x) = mx$) and the correct formulas for all of them by the end of pre-calculus. Such statements on the problem sets and exams could end up costing you *lots of* points. Please catch up quickly in order to reduce your chance of failing this course.

Another reason why MAT 127 is much harder than MAT 125/126 is that the topics covered in MAT 127 are more conceptual/abstract.

Part I is an introduction to ordinary differential equations. It involves *lots of* graphing (without a calculator, of course), which is perhaps the topic that causes the most trouble in MAT 123/125/126. Part I also requires *conceptual* understanding of derivatives: while you are likely able to compute derivatives of many functions, you must also know what this means, in terms of limits, rates of change, and graphs. There will be some integration as well, which will sometimes require use of *partial fractions*. Familiarity with the exponential and log rules will be essential in this part of the course.

Part II is an introduction to infinite sequences and series. It is even more abstract than Part I and causes even more difficulty. A series is the sum of an infinite sequence (string of numbers), but how can one possibly sum up infinitely many numbers? Part II will require *conceptual* understanding of integrals in terms of areas, as well as use of *partial fractions*. This will however be secondary to the main difficulties caused by the new concepts introduced in this part of the course.

Table 2 below clearly shows that you have little chance of passing this course (C or higher) without doing well on Part I.

MTI grade	F	D/C-	C/C+
chance of passing MAT 127	0	16%	37%

Table 2: Chance of passing MAT 127 in Fall 09 after poor scores on Midterm I (excludes those who withdrew from the course; so the actual chances are even lower).

Furthermore (also based on MAT 127 in Fall 09), the chance of your letter grade for the semester being higher than on the first midterm is just 7.6% (about 1/13), while the chance of it being lower is 55.7% (assuming the letter grades are combined as A/A-, B+/B/B-, C+/C, C-/D, F). As Part I is hard, but still easier than Part II, you need to put *lots of effort* into Part I from the first day of the class (assuming you'd like to pass this course).

About Homework Assignments

You *cannot* learn calculus without working on exercises. Nearly all of the assigned problems will be fairly routine exercises from the textbook (and similar *WebAssign* problems) and the notes on second-order differential equations. In addition to working on the assigned problems, you should actually do *all* of the problems in the textbook; just looking at them and deciding that you know how to do them is not enough. This will be time-consuming at first, but if you actually figure out what is going on in each section, the exercises will take you seconds to do (a minute or two for longer ones, especially in Chapter 7) after you do the first few of them. This should greatly help you on the exams.

Starting on the homework as soon as possible after each class should save you a lot of time and help pass the course. You should try to do every homework problem by yourself first, not “with friends”. If you can’t figure out at least half of the problems *completely* by yourself, you are very unlikely to do sufficiently well on the exams to pass this course. If you are unable to do a problem, even after re-reading the relevant sections from the textbook, then discuss it with someone (other students, course instructors/grader, MLC/RTC tutors, etc.). While you are encouraged to compare your answers and solutions to the homework exercises with each other,

you must **write your own solutions** to the problem sets

Make sure to study the solutions to the problem sets after they are posted (even if you can do all homework problems); this may help you on the exams.

While 15% for the homework may not seem like a lot, in the end it will no doubt make a difference in your letter grade for the semester. Each homework will account for more than 1 percentage point of the final grade; so make sure you *always* drop off your homework on time. Even more importantly, doing the homework should help you on the exams; thus, you should not skip *any* homework assignment, even though the lowest homework grade is dropped. It is also essential that you actually *work* on the homework yourself, instead of copying it from friends or MLC/RTC tutors; the latter would help you with the homework grade, but is likely to hurt your exam scores and thus your chances of passing this course. The data shown in Table 3 below is a strong indication that doing the homework (and not copying it from someone else!) is necessary for doing well in this class.

hws missed \ grade	A/A-	B±	C+/C	D/F
0	93%	58%	31%	11%
1	7%	28%	22%	16%
2	0	10%	20%	9%
3	0	3%	9%	5%
4-11	0	3%	18%	59%

Table 3: Percentage of MAT 127 Fall 09 students within each grade range who missed the specified number of problem sets (excludes those who withdrew from the course). Percentages in a column may not add up to 100 due to rounding.

Please read the assigned sections in the textbook thoroughly and *before* the lecture. Each section contains a number of examples that are worked out in detail. You should try to do these examples yourself before going through the book’s explanation; this might help with the homework problems. *You will be responsible for the material contained in the assigned sections of the textbook, whether or not it is directly covered in lecture.* Please do not attempt the homework exercises until you have read the corresponding section in the book.

Since it is not possible to spend much time for review in each lecture, you are expected to be familiar with the material covered in the preceding lectures. Please keep up with the class; it will

be harder to catch up later. You are encouraged to discuss any aspect of this class, including the material covered in lectures, the readings, and the homework exercises, with anyone, including other students in the class and the MLC/RTC tutors. You can also consult any source that may help you with the class in general and the exercises in particular.

Please do not hesitate to help each other; by helping others understand the material, you may end up helping yourself as well. However, letting someone copy your solutions to the homework is not helping them, as it will hurt them on the exams.

About WebAssign

You will need to complete some (many) of the homework problems online, through *WebAssign*, which can be accessed via *Blackboard*. The Stony Brook edition of the textbook comes with a multi-term access code; if you do not have one, you'll need to pay for access through *WebAssign*. Online access to the textbook can also be purchased through *WebAssign*.

The *WebAssign* problems are slightly modified versions of problems in the textbook and come in several forms. Some questions are multiple-choice (sometimes with just two possible answers to choose from). For some questions, you will simply enter numbers. Some questions require using math symbols, such as fractions and square roots; a *CalcPad* window would then appear after you click on the answer box. Some of the *WebAssign* problems are “tutored exercises”; these consist of a series of questions which must be answered in order (more or less) and which lead you to the answer. For all questions on *WebAssign*, you'll get feedback as soon as you submit your answer.

The *WebAssign* homeworks will be made available about 10 days before they are due. You can print them out, work on them anywhere, and submit your answers later (before the deadline, of course). Since each of the problems has many variants, do not try to compare your answers with classmates, but you are encouraged to compare solutions. You can save and/or submit answers to an entire assignment or to each individual question. Please note that *WebAssign* will not automatically submit your answers for scoring if you only save your work; if you save your answers and forget to submit them before the deadline, you will not receive an extension.

With most *WebAssign* problems, you'll have four chances to get the answer right, losing 25% for each incorrect answer. For example, if you get the answer to a 3-point question right on the second try, you'll get 2.25 points. However, if you are given a choice between 2 possible answers, you'll have only one chance to get the answer right.

Complete the <i>WebAssign</i> problems as early as possible in order to avoid any technical issues
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The *WebAssign* site for MAT 127 will be available starting Monday, January 26. You'll have 2 weeks from this date to pay for your access to *WebAssign* (or enter an access code). Thus, you can submit the first *WebAssign* homework before paying for access. Please access *WebAssign* as soon as possible; you will not receive an extension on your *WebAssign* homework if you attempt to access it close to the deadline and are unable to do so.

Some Warnings

You are likely taking this course only because it is required for your degree. Nevertheless, you need to pass it and you must put in whatever effort is required to do so. If you fail this course,

(1) there is no guarantee you'll be allowed to repeat it at Stony Brook:

http://www.stonybrook.edu/commcms/duel/course_retake/

(2) you may not be able to take other courses as planned, which may in turn delay your graduation;

(3) you may fail to satisfy the “good standing” requirements for your fellowship, financial aid, and/or enrollment at Stony Brook.

You should keep these things in mind from the beginning of the semester until you have taken the final exam. Once you have taken the final exam, it will be too late to do anything about your grade, even if you just barely miss the passing cutoff.

Do not fall behind in this course, as it will be much harder to catch up later. As soon as you are unable to figure something out after reading the textbook, ask someone for help: other students in the class, the course instructors/graders, MLC/RTC tutors, or anyone else.

If you are ready to take MAT 127, you should be able to pass it, but **only if** you decide to and actually put in whatever effort is required to do so (which is much more than for MAT 123/125/126).