Math 152A Details

Welcome to Math 152A. If you are new to the ‘A’ sequence, hopefully, you have already received a copy of ‘Welcome to the 15xA Calculus Sequence’. That should give you a good idea of what to expect from this course and, in particular, how it will differ from a ‘typical’ math class. If you were in 151A, welcome back.

My goal for this class is for you to really enjoy it. Yes, there will be exams, but that’s not the point of the course. In this course, you will have the opportunity to work on challenging problems in a variety of contexts. I hope that you learn to enjoy them and that you can take from this class the confidence and understanding that will allow you to apply your skills in the future.

Please understand that this course requires more of you than your ability to memorize procedures. Exams are challenging and require you to have a conceptual understanding of the material so that you can solve problems unlike those you have seen before. If you are looking to just follow step-by-step procedures or plug numbers into some formula, you are probably in the wrong place.

Content: 152A is about the integral, a tool for measuring the total amount of change of certain quantities. As with the derivative, it is fundamental for much of further study in the sciences and engineering. In this course, you are expected to gain an understanding of the definite integral as a limit of Riemann sums and its connection to the derivative, learn to interpret the integral in various contexts, and be able to use the integral in applications to such areas as geometry, physics, economics, etc.

Prerequisites: You should be comfortable with the concepts and techniques of differential calculus (as taught in Math 151 or 151A). You should also be willing to invest time and energy to the course, both inside and outside of class.

Note: Some of the topics listed in the syllabus of Math 152 are not explicitly covered in Math 152A because they were taught in Math 151A. So, if you are coming to Math 152A from Math 151, make sure you get up to speed on these topics by studying the appropriate sections of the textbook: (Inverse functions: section 1.3, Exponential and logarithmic functions: sections 1.2, 1.4, 3.2, 3.6, L'Hopital's rule: section 3.10)

Lectures: The purpose of the lectures is to efficiently cover the topics and ideas of the course. We will move quickly, but you should not hesitate to ask questions or respond to the questions I ask. I will not cover every detail presented in the book; in fact, I will expect that you come to class having already read the section we are to cover. (This is a particularly readable math book.) You will get much more out of lectures when you come prepared and reflect upon the material again later. As with most university courses, it is impossible to go over all course content in lecture. It is important to attend class, but much of your real learning will actually occur in the time you spend outside of class (reading the book and thinking about the concepts and problems). You are responsible for all content in the relevant sections of the textbook, even if it is not explicitly covered in class.

Feedback Slip: At the end of every lecture, you should turn in a half or whole sheet of paper containing the following information:

1. Your name
2. The date
3. An interesting idea from class or something you learned in class.
4. Any questions/concerns/comments you have about the class. Submitted questions will be answered (via email, a handout, etc.).
Suggested Problems: You should attempt the ‘Suggested Problems’ from every section. Your time in lecture and recitation will be most productive when you have devoted time and energy to working through the problems. *Math is not a spectator sport.* If you do not do the Suggested Problems, you should not expect to learn the material of this course. Understanding examples done by someone else (such as your lecturer or TA) is simply not enough! After completing the Suggested Problems, do not hesitate to work on additional problems; extra practice will undoubtedly help your performance in the class.

Office Hours: We encourage you to visit all of us (including the instructor and TA of the 3:30 class) during our office hours. Please do not hesitate to come see us. We are here to help, and it is much better to come in early than to wait until you are in over your head. Avail yourself of office hours early and often.

Office hours are the best place to come with questions about particular problems. (The TAs for this course are not required to visit the Tutor Room.) However, you should not expect to be able to do every problem you encounter on your first attempt; problems in this class are designed to make you think and rethink before arriving at a solution. Don’t give up on a problem until you have really battled with it. We are here to help.

Recitations (100 points): Recitations in the “A” sequence are not homework question and answer sessions. They are designed to actually let you further investigate and use the concepts of the class, applying them to new situations. One important component will be group work. Discussing mathematics with others will greatly enhance your understanding and comfort with the material, and the group assignments will allow you to do this.

Your TA will determine your recitation score (out of 100 possible points) and will give you details during your first recitation. You should expect your score to depend on such things as your regular attendance and participation in recitation, along with group assignments, homework, and quizzes.

Midterms (2, each worth 100 points): The midterm exams are designed to test how well you understand and can work with the topics encountered up to that point in the course. In particular, the exams will be challenging and will emphasize conceptual understanding and applied problems. Prior to each midterm, I will provide you with a list of the sections to be examined, along with suggested review problems. Simply memorizing a standard set of procedures will not prepare you sufficiently for these exams; regular practice with suggested problems and group work in recitations will be crucial to your preparation. Consult the ‘152A Schedule’ for the exact date and time of each midterm.

Final Exam (200 points): The final exam will be similar to the midterms but will be longer, with more problems. It will be cumulative, covering material from throughout the quarter. There will be an emphasis on topics that were not tested on the two midterms.

Gateway Exam: Despite our emphasis on applications and understanding, there are certain specific computational skills that you need to master during the quarter. The Gateway exam is a test of that mastery. It will consist of 6 purely computational questions (functions to integrate). You will have to get 5 of the 6 correct in order to pass (no partial credit), but you will have 5 chances (with different questions each time, of course). The first Gateway will be given in lecture, as indicated on the ‘152A Schedule’. The remaining 4 opportunities will be scheduled outside of class on the days indicated on the ‘152A Schedule’. You can earn bonus points for passing early and you will incur a full letter grade penalty for failing to pass after 5 attempts. (See below.)
Grading Scheme

This is how your course grade will be computed:

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\begin{align*}
R &= \text{Recitation Score} \quad (\text{out of 100 pts}) \\
M_1 &= \text{Midterm 1 Score} \quad (\text{out of 100 pts}) \\
M_2 &= \text{Midterm 2 Score} \quad (\text{out of 100 pts}) \\
F &= \text{Final Exam Score} \quad (\text{out of 200 pts}) \\
G &= \text{Gateway Adjustment} = \\
&\quad +15 \text{ pts if you pass the 1st Gateway} \\
&\quad +10 \text{ pts if you pass the 2nd} \\
&\quad +5 \text{ pts if you pass the 3rd} \\
&\quad 0 \text{ pts if you pass the 4th or 5th} \\
&\quad -50 \text{ pts if you do not pass one of the 5 scheduled exams} \\
\end{align*}
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\begin{align*}
TP_1 &= R + M_1 + M_2 + F + G \quad (\text{standard total}) \\
TP_2 &= R + .5(M_1 + M_2) + 1.5F + G \quad (\text{improvement total})
\end{align*}
\]

The larger of \(TP_1\) and \(TP_2\) will be your \textit{Total Score}, denoted \(TS\).

Your \textit{Percent Score} will be given by \(\frac{TS}{500}\). \textbf{(Note that} \(TP_2\) \textbf{gives extra weight to the Final Exam, so an excellent Final Exam score can partially compensate for weak Midterm scores.)}

Your \textit{final course grade} is then determined by your percent score. You should expect grade assignments to broadly follow the standard scale. However, this may vary to take into consideration exams which were more challenging than a typical exam. I will let you know after each exam approximately where the grade cut-offs for that particular exam would fall.

Please let me know if you have questions or concerns at any time during the quarter.