Math 104 Calculus I Online Summer I 2012
May 21 - June 28

Course objective: The overall goal is to make the class as much like a regular Math 104 class that is offered in the fall or spring as possible. We cover the same material (applications and techniques of integration, sequences, series and differential equations) and use the same text. The main difference is that we offer you the opportunity to take the course online.

Class:
Class will meet 4 times per week for 2 hours each session. The time will be from 5:30-7:30 pm Eastern Standard Time (EST). If you will be in a different time zone, then you just have to adjust for the time difference.

Three of the class sessions (Monday, Tuesday and Wednesday) will be in lecture format. We will use a system that most companies use for conference calls that require the use of the computer, it is called Adobe Connect. You will hear my voice, and occasionally I will turn my webcam on so that you can see me with a video feed. I teach with the aid of PowerPoint slides and the software also has a whiteboard feature that I will use to work out problems with you. There will be a chat feature that will be used simultaneously with the other features. A TA will monitor the chat, answering any questions that students might have regarding lecture and bringing to my attention anything that is worth discussing with the entire class. If you have a microphone and desire to ask or answer a question, I can have a two way conversation with you that the entire class can hear. A video capture of the lecture will be recorded and archived for you to watch whenever you miss a lecture or whenever you might want to go over a topic again.

The fourth class session will be in recitation format on Thursday during the same time slot. You will be able to ask any question you like about the material or about specific homework problems. This session (run by myself and the TA) will also be archived for future viewing.

Attendance will be taken during each class. It is very important that you attend and participate in the lecture. It will be interactive, so your participation is critical. You will be allowed to miss a total of 2 lectures. For all lectures you miss after 2, your course grade will be reduced by 2 percentage points. LPS staff advises students *not* to register for the course if they are unable to attend live sessions.

Text: Thomas’ Calculus, Custom Edition for the University of Pennsylvania. Pearson 2011. ISBN 13: 978-1-256-33339-5. It must be bought in the University bookstore for the relatively low price of $100 (this same text is used in Math 103 and Math 114). Don’t buy the non-custom Penn version of the text because it won’t be bundled with the access code to My Math Lab.

Homework: 20% of your final grade
Your homework will be done with the aid of an online homework system called MyMathLab. You will have approximately 40 questions due per week. You will enter answers symbolically or numerically to problems that are very similar to the problems that are in the textbook. You will know immediately rather or not you got the question right and will have multiple times to enter in a solution. More often than not you will be given a hint to tell you what you might have done wrong. If you have trouble with a question, help is provided in the form of a similar question worked out on video or they will take you step-by-step through the problem. Some of the questions are multiple choice but the majority of them will be short answer. If you are having trouble with a problem you will be able to get help either by watching a video
solution to a similar problem or by going through a step-by-step process to solve a similar problem. Problems will be chosen algorithmically (similar problems with different constants involved) so that few students are working on the same exact problem.

**Quizzes:** 15% of your final grade
We will have periodic quizzes (1 or 2 quizzes per week; one quiz in weeks 2, 4, and 6 since we have exams those weeks) that will check your understanding of the material. These questions will be in a similar format as the homework questions but you will not have multiple chances at the answer. The quiz will be timed as well so that once you start, you will have approximately 30 minutes to complete it. Think of the quizzes as mini-exams.

**Exams:** 65% of your final grade
We will have two midterm exams (20% each) and a final exam (25%). These will be timed, you will have approximately an hour and a half to work on 10-12 problems with only one submission accepted. The midterms can be taken over the weekend at your convenience whenever you can guarantee an uninterrupted internet connection for 90 minutes. All students will take the final exam at the same time (Thursday June 28th from 5:30-7:30pm EST). From the moment you complete the exam, you will have a 30 minute window to scan in your work and submit it for partial credit. This system will be in place for both the midterms and the final.

**Discussions:** Used for students that end up with borderline grades.
We will have weekly discussions on the course material that will be in the form of a threaded discussions and a "twitter-like" chatterbox. Each week you can post a comment and post a response to your fellow student's comments. This is a valuable social networking tool that we use to get students discussing mathematics.

**Get Help:**
Before it’s too late, please seek out help. One definition of too late is after you receive a low exam 1 score. The hardest part of the course is keeping up with the pace. We cover 15 weeks of material in 6 weeks. Each lecture will cover about two sections of material. If you miss a class and don't get a chance watch the archived video before the next class, then you will find it hard to catch up. Each section builds off of the previous one so waiting until the weekend to catch up might be impractical. Be sure to ask lots of questions.

**Are you ready?**
The class starts with integration so you need to have a good grasp of integration (what it is, how to use the Fundamental Theorem of Calculus, and how to use substitution) on day one. You also need to know how to find limits and derivatives. Clicking on the link below will take you to a Math 104 readiness exam, the ability to do well on this exam indicates readiness for Math 104.

[http://www.math.upenn.edu/~rimmer/math104/online/104readiness.pdf](http://www.math.upenn.edu/~rimmer/math104/online/104readiness.pdf)

Another good indication of readiness is a good performance on a Math 103 final exam. Archives of these exams can be found here:

[http://www.math.upenn.edu/ugrad/calc/m103/oldexams.html](http://www.math.upenn.edu/ugrad/calc/m103/oldexams.html)

If you find that you are weak in some areas but are willing to work hard to overcome it, then I recommend staying in the course and giving it your all. A good place online to get some help in these areas can be found by following the link below:

[http://tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx](http://tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx)
MATH 104 Online Schedule:

Week 1:

Monday, May 21: Introduction and Review Integration / U-Subs. / Area Between Curves / Average Value
Tuesday, May 22: Sections 6.1 Volumes (Cross –Sections, Disk and Washer) and 6.2 Volumes by Shell Method
Wednesday, May 23: Section 6.3 Arc Length and Section 6.4 Surface Area of Revolution
Thursday, May 24: Recitation

Week 2:

Monday, May 28 -- No lecture, Memorial Day
Tuesday, May 29: Section 8.1 Integration by Parts and Section 8.2 Integrating Powers of Trig. Functions
Wednesday, May 30: Section 8.3 Trig. Substitution and Section 8.4 Partial Fraction Decomposition
Thursday, May 31: Review and Catch up

Week 3:

Monday, June 6: Section 8.7 Improper Integrals and Section 8.8 Probability
Tuesday, June 7: and Section 6.6 Center of Mass and
Wednesday, June 8: Section 8.6 Approximate Integration Review and
Thursday, June 9: Recitation

Week 4:

Monday, June 13: Section 10.1 Sequences and Section 10.2 Introduction to Series
Tuesday, June 14: Section 10.3 Integral Test and Section 10.4 Comparison Tests
Wednesday, June 15: Section 10.5 Ratio and Root Test and Section 10.6 Alternating Series Test and Abs. Conv.
Thursday, June 16: Recitation

Week 5:

Monday, June 20: Section 10.7 Introduction to Power Series
Tuesday, June 21: Section 10.8 Taylor and Maclaurin Series
Wednesday, June 22: Section 10.9 and 10.10 Application of Taylor Series
Thursday, June 23: Recitation

Week 6:

Monday, June 27: Section 7.2 Separable Differential Equations
Tuesday, June 28: Section 9.2 Linear Differential Equations
Wednesday, June 29: Review / Catch up
Thursday, June 30: FINAL EXAM 5:30-7:30pm

If you have any questions regarding the course, email Professor Rimmer at rimmer@math.upenn.edu