Math 114 Calculus II Online Summer II 2012

July 2 – August 10

Course objective: The overall goal is to make the class as much like a regular Math 114 class that is offered in the fall or spring. We cover the same material (vectors, vector functions, vector calculus, multi-variable calculus, linear 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 bring to my attention anything that is worth discussing with the entire class. If you have a microphone and wanted 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 3 lectures. For all lectures you miss after 3, your 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 August 9th 5:30-7:30pm EST). You will have a 30 minute window to scan in your work for partial credit for both the midterms and the final.

Discussions: Used for students that end up with borderline grades.
We will have discussions on the course material that will be in the form of a threaded discussions and a "twitter-like" chatterbox. Each week you will be required to 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 first two chapters cover an introduction to vectors which might be new for most students. The next two chapters take everything you learned from Calc I and II and covers it for multiple variables. So a good knowledge of limits, derivatives, and integrals of single variable functions is critical to do well on this material. The final chapter looks at the connection between vectors and calculus. We will also cover a chapter on differential equations. A good indication of readiness is a good performance on a Math 104 final exam. Archives of these exams can be found here:
http://www.math.upenn.edu/ugrad/calc/m104/oldexams.html

MATH 114 Online Schedule :

Week 1:

Monday, July 2: Introduction and Review
Tuesday, July 3: 12.1 Three Dimensional Coordinate Systems, 11.4 Conic Sections
Wednesday, July 4 -- No lecture, Independence Day
Thursday, July 5: 12.6 Cylinders and Quadric Surfaces, 12.2 Vectors

Week 2:

Monday, July 9: 12.3 The Dot Product, 12.4 The Cross Product
Tuesday, July 19: 12.5 Equations of Lines and Planes, 13.1 Introduction to Vector Functions, 13.2 Motion in Space : Velocity and Acceleration
Wednesday, July 19: 13.3 Arc Length, 13.4 Curvature, 13.5 Motion in Space : Velocity and Acceleration
Thursday, July 12: Recitation

Week 3:

Monday, July 16: 14.1 Functions of Several Variables, 14.2 Limits and Continuity, 14.3 Partial Derivatives
Tuesday, July 17: 14.6 Tangent Planes, Linear Approximations, and Differentials, 14.4 The Chain Rule
Wednesday, July 18: 14.7 Maximum and Minimum Values
Thursday, July 19: Recitation

Week 4:

Monday, July 23: 14.6 Directional Derivatives and the Gradient Vector, 14.8 Method of Lagrange Multipliers
Tuesday, July 24: 15.1 Double integrals over Rectangular Regions, 15.2/15.3 Double Integrals over General Regions, and Area as a Double Integral
Wednesday, July 25: 15.4 Double Integrals in Polar Coordinates, 15.6 Applications of Double Integrals
Thursday, July 26: Recitation

Week 5:

Monday, July 30: 15.5/15.7 Triple Integrals in Rectangular, Triple Integrals in Cylindrical and Spherical Coordinates
Tuesday, July 31: 15.8 Change of Variables in Multiple Integrals
Wednesday, August 1: 16.1/16.2 Vector Fields and Line Integrals
Thursday, August 2: Recitation

Week 6:

Monday, August 6: 16.3 Fundamental Theorem for Line Integrals, 16.4 Green's Theorem
Tuesday, August 7: 7.2 Separable Differential Equations**,** 9.2 Linear Differential Equations
Wednesday, August 8: Review
Thursday, August 9: **FINAL EXAM 5:30-7:30pm**

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