



University of Pennsylvania

Math 114 Calculus Part II (Multivariable and Vector Calculus) Spring 2013

Professor : Nakia Rimmer

Email : rimmer@math.upenn.edu

Office : DRL 4C21

Office Hours : Mon. 4-5 pm , Tue. 10:30-11:30 am, Thur. 1-2 pm, or by appointment

Course objective: To apply the basic concepts found in a first year calculus course to multivariable functions (limits, differentiation, and integration). To understand the three major theorems of vector calculus.

Class : Lecture will meet three times a week on Mondays, Wednesdays and Fridays from 2:00-2:50 pm. Students will also be required to attend a 50 minute recitation once weekly. Recitation will be a question and answer session run by a teaching assistant. Attendance in recitation is mandatory, you will take a weekly quiz in recitation and there will be no make-up quizzes. Lecture attendance will be taken and will be used when a student's grade ends up on the cutoff between two different letter grades. It is very important that you attend and participate in the lecture. It will be interactive, so your participation is critical.

Classroom Decorum: Students must be on time for class and should refrain from leaving and re-entering the classroom during lecture. If a student has a legitimate reason for being excused early from class, then he or she should discuss this with me before class. Cell phones may not be used during class (**no texting**) and should be silent. Laptops may not be used for anything other than taking notes. It is important that you refrain from excessive talking during lecture as a courtesy to your fellow students. Students will receive Course Problem Notices (CPNs) for poor attendance, poor test grades, poor homework or quiz grades, or poor behavior in lecture.

Course Webpage : <http://www.math.upenn.edu/~rimmer/math114/>

Blackboard will be used as a grade server so that students can always know their standing in the course. There will be a lecture blackboard site (for exam grades) and a recitation blackboard site (for hw and quiz grades).

Text: *Thomas' Calculus*, Custom Edition for the University of Pennsylvania. Pearson 2012. Package ISBN : 978-1-256-82329-2. It must be bought in the University bookstore for the relatively low price of \$100 (this same text is used in Math 104 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

10% online HW: We will use the online homework system called My Math Lab, the login link is:

<http://portal.mypearson.com/mypearson-login.jsp> . An access code comes with the purchase of the new text from the bookstore. The courseID is : **rimmer80733**. 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. Some of the questions have multiple choices 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. For details on creating a My Math Lab account and connecting to our course, follow the link:

<http://hans.math.upenn.edu/~rimmer/math114/homework/114mymathlabinstr.pdf> . Five percent of the total points available will be dropped.

10% Hand-in HW: Exam ready questions mostly taken from past final exams. Handed in weekly at the beginning of lecture on Fridays. It will be graded for completeness. The first one will be due on Friday Jan. 25th. We will drop the lowest score.

Quizzes: 10% of your final grade

You will have weekly quizzes during the last 10-15 minutes of recitation over homework problems that were turned in the previous week. Think of the quizzes as mini-exams. The lowest quiz score will be dropped. There will be no make-up quizzes given. Quizzes will start in week 3 (1/22 and 1/24).

Exams: 70 % of your final grade

There will be three closed book in-class midterm exams (Lowest 10%, Other two 15% each). You are not allowed to use a calculator during the midterm and final exams but you can prepare and use one 8.5" by 11" sheet of paper (both sides) with handwritten notes of your choice. The final exam will be cumulative (covers all material), common (all 114 students take the same exam) and take place on **Wednesday May 1st from 12-2 pm**. It will count for 30 % of your final grade. Since the exams are given in class there will be absolutely **no** make-up exams.

The final exam is used to set the curve at the end of the course, it determines the grade distribution. For example, after grading the final exam the Math 103 professors get together and decide what grade is considered an A, B, C, D, or F and then we tally the performance of each class to determine the distribution of each grade. Say for instance the distribution for my class is 32% A, 38% B, 25% C, 4% D and 1% F. This then becomes the course grade distribution, all students will be ranked from highest to lowest and the top 32% will be given some form of an A, the next 38% will be given some form of a B, and so on. The + or – cutoffs are determined by gaps in the distribution. No curve occurs until the end of the course so each midterm isn't curved. I will give you an idea of your ranking after each midterm so that you can get a feel for where you stand in the course.

No Calculator : Using a graphing calculator (or any type of calculator) is forbidden in this class.

ADA Compliance : The Office of Student Disabilities Service (SDS) is part of the Weingarten Learning Resources Center. It provides accommodated exams and assistive technology (along with many other services) to students that self-identify in compliance with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Please see their website

(http://www.vpul.upenn.edu/lrc/sds/current_students.php) for more information.

This most often takes the form of students that require extra time to take an exam taking the exam at the Weingarten Center.

Code of Academic Integrity : The following is from the University's website on academic integrity "Since the University is an academic community, its fundamental purpose is the pursuit of knowledge. Essential to the success of this educational mission is a commitment to the principles of academic integrity. Every member of the University community is responsible for upholding the highest standards of honesty at all times. Students, as members of the community, are also responsible for adhering to the principles and spirit of the following Code of Academic Integrity found here http://www.upenn.edu/academicintegrity/ai_codeofacademicintegrity.html If a student is unsure whether his action(s) constitute a violation of the Code of Academic Integrity, then it is that student's responsibility to consult with the instructor to clarify any ambiguities.

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. Each lecture will cover about 1 to 1 ½ 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.

1. Ask lots of questions in recitation. Take advantage of recitation, don't just show up to take the quiz.
2. Instructor's office hours
3. TA's office hours

From the Math Department:

<http://www.math.upenn.edu/ugrad/calc/help/schedule.html>

4. Sunday Night Reviews (7-9pm each week)
5. Math/Maple Center (Mon. - Thurs. 6:30-9:30pm in various dorms)
6. Online Help (Discussion board on Blackboard's **plenary** site for your class monitored M-Th 9pm - 1am)

From the University:

7. Learning Resource Center, offered by the Weingarten Learning Resources Center, in Stouffer Commons, Suite 300, 3702 Spruce Street, Philadelphia PA 19104, tel: (215) 573-9235 <http://www.vpul.upenn.edu/lrc/>
8. The Tutoring Center : <http://www.vpul.upenn.edu/tutoring/index.php>
9. Math Department Approved Tutors : <http://www.math.upenn.edu/ugrad/tutors.html>

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>

Topics covered in Math 114:

Section	Title
12.1	Three-Dimensional Coordinate Systems
12.2	Vectors
12.3	The Dot Product
12.4	The Cross Product
12.5	Lines and Planes in Space
11.6+12.6	Conic Sections, Cylinders and Quadric Surfaces
13.1	Curves in Space and Their Tangents
13.2	Integrals of Vector Functions; Projectile Motion
13.3	Arc Length in Space
13.4	Curvature and Normal Vectors of a Curve
13.5	Tangential and Normal Components of Acceleration
13.6	Velocity and Acceleration in Polar Coordinates
14.1	Functions of Several Variables
14.2	Limits and Continuity in Higher Dimensions
14.3	Partial Derivatives
14.4	The Chain Rule
14.5	Directional Derivatives and Gradient Vectors
14.6	Tangent Planes and Differentials
14.7	Extreme Values and Saddle Points
14.8	Lagrange Multipliers

Section	Title
15.1	Double and Iterated Integrals over Rectangles
15.2	Double Integrals over General Regions
15.3	Area by Double Integration
11.3+15.4	Polar Coordinates and Double Integrals in Polar Form
15.5	Triple Integrals in Rectangular Coordinates
15.6	Moments and Centers of Mass
15.7	Triple Integrals in Cylindrical and Spherical Coordinates
15.8	Substitutions in Multiple Integrals
16.1	Line Integrals
16.2	Vector Fields and Line Integrals
16.3	Path Independence, Conservative Fields, and Potential Functions
16.4	Green's Theorem in the Plane
16.5	Surfaces and Area
16.6	Surface Integrals
16.7	Stokes' Theorem
16.8	Divergence Theorem

Math 114 Spring 2013 Sect. 003 MWF 2-2:50 pm DRL A1

January				
Monday	Tuesday	Wednesday	Thursday	Friday
		9 Intro./12.1	10	11 12.1
14 12.2	15	16 12.3	17	18 12.4
21 MLK No Class	22	23 12.5	24	25 12.6
28 13.1	29	30 13.2	31	

February				
Monday	Tuesday	Wednesday	Thursday	Friday
				1 13.3
4 13.4	5	6 13.5	7	8 Exam # 1
11 13.6	12	13 14.1	14	15 14.2
18 14.3	19	20 14.4	21	22 14.5
25 14.6	26	27 14.7	28	

March				
Monday	Tuesday	Wednesday	Thursday	Friday
				1 14.8
4	5 Spring	6	7 Break	8
11 15.1	12	13 15.2	14	15 15.3
18 15.4	19	20 15.5	21	22 Exam # 2
25 15.6	26	27 15.7	28	29 15.8

April				
Monday	Tuesday	Wednesday	Thursday	Friday
1 16.1	2	3 16.2	4	5 16.3
8 16.4	9	10 16.5	11	12 Exam # 3
15 16.6	16	17 16.7	18	19 16.8
22 Rev.	23	24 Reading	25	26 Days

Drop Period Ends February 15th
 Withdrawal Period Ends March 29th
 Last Day of Classes April 23rd

May				
Monday	Tuesday	Wednesday	Thursday	Friday
29 Rev.	30	1 Final Exam 12-2pm	2	3