University of Virginia
Course Syllabus: MATH 1220–003
Applied Calculus II
Spring 2017

Instructor: Mark Schrecengost
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Class location: Monroe Hall 116
Class meeting time: MWF 11:00-11:50AM

Office Hours: Tuesday 10-11,1-2; Thursday 11-12 and by appointment.

Prerequisites: Math 1210 or equivalent. This material is covered in Chapters 1–6 of the course text (which you should review as needed).

Course Description: Math 1220 is a second calculus course for business, biology, and social-science students. Math 1220 is a coordinated course. This means that all sections cover the same material and take the same tests.

Because this is a second course in calculus, you already know that calculus provides two fundamental tools for analyzing functions: the derivative and the definite integral. In this course, you'll be using calculus to analyze trigonometric functions, probability density functions, functions depending on two variables, and functions defined by power series. You will also be introduced to mathematical modeling with differential equations, learning two techniques for solving such equations.

Course Objectives: Upon successful completion of this course, students will

(1) be able to compute and to estimate values of the sine and cosine functions using their definitions and be able to apply the tools of calculus to analyze trigonometric functions;

(2) be able to set up integral formulas to solve applied problems;

(3) be able to analyze functions of two variables through their graphs, which are typically surfaces in three-dimensional space, as well as through partial derivatives and double integrals;

(4) be able to solve separable first-order differential equations exactly and be able to find approximate solutions to initial-value problems for first-order equations via Euler's method;

(5) know how to use the probability-density function for a continuous random variable X to compute associated probabilities as well as the expected value, variance, and standard deviation of X;

(6) develop intuition concerning when a series of real numbers converges and be able to confirm or correct that intuition by applying an appropriate test for convergence/divergence;

(7) be able to use power series to define new functions as well as represent famous old functions such as $f(x) = e^x$, $f(x) = \sin(x)$ and $f(x) = \cos(x)$;

(8) have further developed their problem-solving skills and strategies through modeling and solving a wide variety of problems, including some with real-world applications;

(9) be able to communicate mathematics with clarity and precision.

Am I in the right calculus class? Read the Mathematics Department's Placement Information.

Textbook: *Applied Calculus for the Managerial, Life, and Social Sciences* by Soo T. Tan, 9th edition (Publisher: Brooks/Cole Cengage Learning). An electronic edition of the text is provided through the on-line homework system WebAssign, to which you must have access. Acquisition of a physical copy of the text is optional. Any student who purchased WebAssign for Math 1210 at UVA may already have WebAssign access for this course via the same code used for Math 1210. Try your code!

If you must purchase WebAssign for Math 1220, you have several options:

(1) purchase WebAssign single-term access on-line through the WebAssign website,

(2) purchase a single-term WebAssign-access card at the UVA Bookstore,

(3) purchase a physical copy of the text, bundled with a multi-term WebAssign-access card, at the UVA Bookstore, or

(4) purchase WebAssign via (1) or (2) and, if you want a hard-copy of the text, buy a used copy from the Bookstore.

There is a two-week grace period at the beginning of the term during which you have free WebAssign access to the text and course homework sets — go to http://www.webassign.net/uva/login.html, and via the gray button on the upper right, enter our class key: virginia 2770 4062

Assessments

Diagnostic Quiz: On Monday, January 30th, there will be a quiz (15–20 minutes) consisting of problems designed to test your basic math/calculus skills. This quiz provides an assessment of your level of preparedness for Math 1220. It will be designed to give you a good idea of whether or not you have the necessary background skills to take Math 1220.

Classwork: There will rarely be formal classwork but lectures will be interactive and students will be expected to follow along with problems, occasionally trying them on their own, as well ask asking and answering questions.

Homework: Most homework for this course will be delivered through the WebAssign system: go to http://www.webassign.net/uva/login.html and enter our class key virginia 2770 4062. The system will give you immediate feedback and you will be allowed to attempt problems multiple times. You should record your work on a given problem by hand (just as if you were working through a test problem) and then enter your response into WebAssign. Keep in mind that when you respond to problems on exams and quizzes your work, as well as your answers, will be evaluated. When you have trouble with a homework problem, be alert to what you learn as you work toward a solution.

There will also be weekly written assessment (homework or quiz) in class to test your knowledge and prepare you for the types of questions that you may see on the midterms and final. At the end of the semester the lowest of these scores will be dropped.

Midterms Exams: There will be two evening midterm exams given during the semester. The exams are common to all sections of MATH 1220. The dates of these exams are as follows:

Midterms Exam 1: Thursday, February 23rd, 7-8:30 p.m.
Midterms Exam 2: Wednesday, April 12th, 7-8:30 p.m.

For those students who have a time conflict with another course, a make-up exam will be given the following morning beginning at 7:20 am. If you have a direct conflict with either of the above listed exam times, please notify me as soon as possible and at least one week before the exam date. If proper notice cannot be given, then a request for the make-up exam will be honored only in cases of extreme emergencies and

at my discretion. Midterm and final exams will be graded in common, with all Math 1220 instructors participating.

Final Examination: The final exam will be given Monday, May 8th from 7:00 to 10:00 pm. This is the time reserved for the MATH 1220 final exam by the University and all sections of MATH 1220 take the common final examination at the same time. It is University policy that final exams may not be taken early. The final exam is comprehensive.

Course Grade : The course grade will be determined as follows:

WebAssign homework	10 points
Written homework/Quizzes	12 points
Diagnostic Quiz:	3 points
Midterm Exam 1:	20 points
Midterm Exam 2:	25 points
Final Examination:	30 points
	100 points possible

The number of points you earn will be mapped to a letter grade as follows:

A+: [98, 100]	A: [93, 98)	A-: [90, 93)	B+: [87, 90)	B: [83, 87)	B-: [80. 83)
C+: [77, 80)	C: [73, 77)	C-: [70, 73)	D+: [67, 70)	D: [63, 67)	D-: [60, 63)

In borderline cases, your letter grade may be higher—the one assigned to the interval immediately above the one your point total lies in.

Policies

Attendance and Classroom Etiquette: Regular attendance is expected as is class participation. Please arrive on time, turn off your cell phone, and stay for the entire class period. Unless otherwise instructed, you may not use any electronic devices during class. Studies suggest that student multi-tasking during class through use of smart phones and laptops hinders classroom learning for both users and *nearby peers*.

Calculators: Calculators will not be allowed for any quizzes or exams. Thus, as much as possible, try to complete homework problems without using a calculator. (For some homework problems, you will find a calculator or Wolfram Alpha to be helpful.)

Learning needs: All students with special needs requiring accommodations should present the appropriate paperwork from the Student Disability Access Center (SDAC). It is the student's responsibility to present this paperwork in a timely fashion and follow up with the instructor about the accommodations being offered. Accommodations for test-taking (e.g., extended time) should be arranged at least 5 business days before an exam.

Honor code: The Honor Code will be strictly observed in this class. Please remember to pledge each quiz and exam.

Tips for success

- Use class time wisely: fully engage yourself in classroom discussions, asking and answering questions when appropriate.
- Seek understanding rather than trying to rely on memorized formulas.
- Take advantage of your instructors office hours as well as the Mathematics Tutoring Center.
- It is nearly impossible to understand mathematics without working problems yourself; thus, devoting sufficient time and attention to homework assignments is crucial to success in this course.

• Before beginning work on a homework-problem set, think about material discussed in class pertaining to the set—make sure you know and understand the definitions, theorems, concepts, and problem-solving principles emphasized in class. Try to work problems without looking at your notes or the exposition in the text. When you work homework problems without relying on notes, you're re-enforcing your understanding of the principles you reviewed just before beginning work on the problem set. Also, when you take this approach each homework assignment becomes a practice test.

Course Content

We will cover the following chapters of the course text:
Chapter 12: Trigonometry
Chapter 6: Integration (Sections 6.5 and 6.6)
Chapter 7: Additional Topics in lntegration (Sections 7.1, 7.4, and 7.5)
Chapter 8: Calculus of Several Variables (omitting Sections 8.5 and 8.6)
Chapter 9: Differential Equations
Chapter 10: Probability and Calculus
Chapter 11: Taylor Polynomials and Infinite Series (omitting Section 11.7 as well as the discussion of error bounds in 11.1)

Important Dates:

Classes Start ..... Wednesday, January 18th
Last day to add a course ..... Wednesday, February 1st
Last day to drop a course ..... Thursday, February 2nd
Midterm Exam 1 ..... Thursday, February 23, 7-8:30 p.m.
Last day to withdraw from a course: ..... Wednesday, March 15th
Midterm Exam 2 ..... Wednesday, April 12, 7-8:30 p.m.
Last day of classes ..... Tuesday, May 2nd
Final Exam ..... Monday, May 8th from 7:00 to 10:00 p.m.