MATH 2143: Advanced Calculus III

Description: A rigorous treatment of the mathematics underlying the main results of multivariable calculus. Intended for students with strong interest and ability in mathematics who have taken 2142. (May be taken for honors credit but open to any qualified student.)
Prerequisites: MATH 2142(244) or consent of instructor. MATH 2143(245) may be used in place of MATH 2110(210) to fulfill any requirement satisfied by MATH 2110(210).

Instructor: Luke Rogers

Basics

Instructor: Luke Rogers
Instructor's Office Hours: TBD in MONT 339.
Lectures: Tuesdays and Thursdays, 12:30-1:45pm in MONT 414, and Fridays 12:20-1:10pm in MONT 226.
Textbook: Calculus Volume 2 (2nd Ed.) by Thomas Apostol**.**
Grading Scheme: Homework and class participation 30%, Midterm 30%, Final 40%.

What is expected of you

This is a difficult class. It requires quite a lot of work from you, most of which will occur outside the classroom. My main expectations are that

- You read the material before each class. This includes attempting to understand the concepts and trying the problems on your own. A schedule of the course material is available.
- You complete your homework
- You ask questions in class and actively participate in learning.
- You come to see me at my office hours if you are having difficulties with the material, are bored, want more (or less) work, would like to know more about the topics, or have any questions about the class. In my experience, the students who do this are the ones who do well in the class.

Academic Integrity

The University of Connecticut expects that its students will adhere to a high level of integrity in their academic work. You may find information about the academic integrity policy as it pertains to students in The UConn Student Code

University Services

The university has many services that may provide support if you are having difficulties in or outside the classroom. Here is a useful list of resources for UConn students.

Schedule

We will attempt to cover most of Chapters 1,2,3,8,10,11 and some of 9 and 12 from Apostol Vol 2 as listed below.

Date	Day	Sections
Aug 30	Tues	Review
Sep 01	Thus	1.1-1.5
Sep 02	Fri	1.6-1.7
Sep 06	Tues	1.8-1.11
Sep 08	Thus	1.12-1.14
Sep 09	Fri	1.15-1.17
Sep 13	Tues	2.1-2.4
Sep 15	Thus	2.5-2.8
Sep 16	Fri	2.9-2.12
Sep 20	Tues	2.13-2.16
Sep 22	Thus	2.17-2.18
Sep 23	Fri	2.19-2.20
Sep 27	Tues	3.1-3.4
Sep 29	Thus	3.5-3.8
Sep 30	Fri	3.9-3.12
Oct 04	Tues	3.13-3.16
Oct 05	Thus	8.1-8.5
Oct 07	Fri	8.6-8.10
Oct 11	Tues	8.11-8.14
Oct 13	Thus	8.15-8.17
Oct 14	Fri	8.18-8.22
Oct 18	Tues	Review
Oct 20	Thus	Midterm on Chapters 1,2,3,8.1-8.10
Oct 21	Fri	Postmortem
Oct 25	Tues	9.1-9.5
Oct 27	Thus	9.6-9.10
Oct 28	Fri	9.11-9.13
Nov 01	Tues	9.14-9.15
Nov 03	Thus	10.1-10.5
Nov 04	Fri	10.6-10.9
Nov 08	Tues	10.10-10.14
Nov 10	Thus	10.15-10.21
Nov 11	Fri	11.1-11.7
Nov 15	Tues	11.8-11.11
Nov 17	Thus	11.12-11.17
Nov 18	Fri	11.19-11.22
Thanksgiving		
Nov 29	Tues	11.23-11.25
Dec 01	Thus	11.26-11.28
Dec 02	Fri	11.31-11.34
Dec 06	Tues	12.1-12.4
Dec 08	Thus	12.5-12.10
Dec 09	Fri	12.11-12.15

Homework

Most of what you learn in this course will be the result of working exercises that are designed to reinforce key concepts, develop skills, and test your understanding of the material. There will be textbook exercises due at the end of every week on lecture material. Some of the exercises are straightforward, others are very complex.

In general homework is due every Friday. Late homework will not be accepted. Although it should be done daily, it will only be collected once per week, on Friday in class. The first assignment is due on Friday, September 9th.

You are encouraged to talk with your classmates about the homework. If you have difficulties, do not waste time --- get help! Please come to office hours!

Late homework will not be accepted. I expect full answers, with explanations and complete proofs. If you have used some source in order to solve a problem (a book or a website) then make sure to cite your references.

The homework is the most important part of the course. No matter how well you think you understand the material presented in class, you won't really learn it until you do the problems.

Some Homework Solutions

Due Date	Homework Set
09/09/16	• Pg 7: 6,10,13,14,19,20. • Pg 13: 5,10,14,22(e,f,g), 23(d,h).
09/16/16	• Pg 20: 6,9,12. • Pg 30: 1,4,6 • Pg 35: 4,5,9,12,22,23,25.
09/23/16	• Pg 42: 2,11,27 • Pg 50: 2,10,16 • Pg 57: 4,9
09/30/16	• Pg 67: 6,9,13 • Pg 68: 2,4,7 • Pg 80: 4,10

10/07/16	• Pg 85: 1,7 • Pg 94: 1,2,3,5
10/14/16	• Pg 246: 2e,g,l, 7 • Pg 251: 1 b,h,,i, 2, 4, 6 • Pg 256: 2, 10, 12, 20 • Pg 262: 1,4,5,10
10/28/16	• Pg 269 : 1,3,6,10 • Pg 276: 2,11,14 • Page 286: 3, 6
11/04/16	• Pg 302: 2, 5, 8, 9 • Pg 313: 2, 7, 12, 19, 21
11/11/16	• Page 328: 4,7,12 • Page 336: 3,9
11/18/16	• Page 345: 2,9,11,15 • Page 349: 4,9 • Page 362: 4,7,11
12/02/16	• Page 371:6,10,12,21 • Page 385:1,2
12/09/16	• Page 399:4,7,14,17 • Page 413:3,7,12 • Page 429: 3,6,8

Exams

MIDTERM EXAM: In-class on Thursday October 20th.

Things to know for midterm

Practice midterm. Will appear here at least one week before the midterm.

FINAL EXAM: Date and location to be determined by the Registrar. For provisional information, see the Registrar's website.

The final exam will cover material from the entire course, but there will be an emphasis on material covered after the midterm.

Things to know for final

Practice Final. Will appear here at least one week before the final.

Textbooks, notes, calculators and cellphones are not permitted to be used during exams.

WARNINGS:

1. If you cannot take an exam at the scheduled time, you MUST let your instructor know BEFORE the exam; you will almost certainly get an 'F' on an exam if you miss it for any reason and then try to explain later.
2. Incomplete grades will be given only under exceptional circumstances and then only to students who have a passing grade on a substantial part of the course. Do not expect to be granted an incomplete simply because you have fallen behind in the course.

Advice on Reading a Math Book

You are expected to read the appropriate sections of the book **before** lecture, according to the schedule provided. You'll also be reading the book when you're working on homework problems and studying for exams and quizzes.

Here are some tips on how to read the book:

- *Always have pen and paper handy when reading*. Check all the calculations. Fill in the details when they're left out. Keep track of your ideas and questions as you're reading. Keep working without even looking at the book.
- *Give yourself the time and energy to do the reading*. Reading a math book is not like reading a novel. It takes more time and energy. You'll need a reasonable block of time and an active mind to get something out of it.
- *Work the examples without looking at the solutions*. Learning mathematics is never a passive experience. The best way to make use of example problems in the book is to

start them on your own without looking at the solution. If you're stuck or confused, you should peek a little bit at the solution, and then try to finish the rest yourself.

- *Math books follow a logical order*. Remember that each sentence, paragraph, and page usually depends on the previous one. If you don't understand something, you should be hesitant about continuing on until you do. It is usually a good idea to first skim for an overview to catch key ideas, then reread with concentration.