MAA5103/MAA5105: ADVANCED CALCULUS FOR ENGINEERS AND PHYSICAL SCIENTISTS 2

May 6, 2021

Note: Alpha Version of Syllabus.

Syllabus **2**
- Course Description . . . 2
  - Prerequisites . . . 2
  - Course Materials . . . 2
  - Online Resources . . . 2
  - One Week Policy . . . 2
- Lectures . . . 2
- Course Assignments and Grading . . . 2
  - Grade Structure . . . 3
- UF Policies . . . 3
  - Incomplete Policy . . . 3
  - Online Course Evaluation . . . 3
  - Honor Code . . . 3
  - Students with Disabilities . . . 3

Calendar **4**

Syllabus

Course Description

The course is a continuation of MAA 4102 and MAA 5104. The primary goal of the course is to obtain a sound understanding of the basic mathematical concepts of calculus. A secondary goal is to improve the ability to reason carefully and creatively when dealing with mathematical material.

I recommend you review sections 5.3 – 5.5.

We will cover sections 6.1 – 6.5, and 7.1 – 7.4. Topics include; the Riemann integral, and infinite series.
If we have time we will discuss uniform versus pointwise convergence of functions; sections 8.1-8.3.

Prerequisites

An introduction to proof course (such as MHF3202: Sets and Logic) and the first part of this two part series MAA4102 or MAA5104.

Course Materials

Text: Witold A. J. Kosmala, A Friendly Introduction to Analysis, second edition, Pearson Prentice Hall, Upper Saddle River, NJ 07458.
Note that this book is not great, but it is the department book used from first semester. We will be referencing some parts of the book throughout, and there are recommended problems from the book for practice; but if you can get these parts from a classmate or elsewhere, then you don't need the book itself.

Online Resources

The lectures for this course will be provided via online videos (see lectures below). The goal is to have all content delivered asyncronously, meaning that even "live online content" (such as office hours or any regular meetings) will be recorded and posted for later view. Attendance, although highly suggested, is not mandatory.

One Week Policy

Please be aware of the **One Week Policy**: Once you receive a graded paper back, you have **one week** to contest the grade and initiate any grade disputes. Once this one week passes, **there are no further disputes**. In particular, once the end of the semester nears, you *cannot* start disputing, say, grades from the first week or two.

Lectures

As noted above the intent of this course is to have most of the primary instruction provided by video presentations of key theorems and proofs. This is mostly because this medium is significantly easier to follow and present for large chunks of information (such as a proof) rather than writing out on a piece of paper with a document camera.

This is not to say, however, that you are expected to simply watch the videos and instantly know and understand everything. Think of the online videos as a starting point, and a good review tool to be able to go back and re-watch content as needed (in preparation of an exam for instance). However, I would be very surprised if nobody had any questions about aspects of the videos, proofs, or theorems, no matter how well presented they may be (and let's be honest, I'm sure the presentations aren't flawless no matter how hard I try!) So the purpose of office hours and/or regular meetings is to provide a forum to go through examples and answer questions anyone may have.

Course Assignments and Grading

Currently the plan is to provide regular practice problems that will be optional (think of it as practice content and potential exam problems). Since part of the goal of this course is to improve your ability to correctly express and convey mathematical ideas, there will be regular proof writing homework, which will be collected (I will notify you which are potentially collected and which are suggested for practice).

There will also be Exams and a Final Exam. There will be more on this discussed at the beginning of the semester and this section will likely be updated after the first week of class.

Grade Structure

The grade composition will be as follows:

Grade Contribution by Assignment

Assignment	Point Value	Total Contribution
Three Homeworks	10 points each	30 points
Two Midterms	20 points each	40 points
Final Exam	30 points	30 points

Point Interval For Each Letter Grade

Grade	Point Range	Grade	Point Range
A	90-100	C	70-73
A-	87-89	C-	67-69
B+	84-86	D+	64-66
B	80-83	D	60-63
B-	77-89	D-	57-59
C+	74-76	E	00-56

UF Policies

The below are standard UF and math department policies, recorded here for reference and your information.

Incomplete Policy

A grade of I (incomplete) will be considered only if you meet the Math Department criteria which is found at https://www.math.ufl.edu. If you meet the criteria you must see the instructor before the beginning of finals week to be considered for an I. A grade of I only allows you to make up your incomplete work. You cannot redo any previously completed work.

Online Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://gatorevals.aa.ufl.edu/. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open.

Honor Code

All students are required to abide by the Academic Honesty Guidelines which have been accepted by the University. The academic community of students and faculty at the University of Florida strives to develop, sustain and protect an environment of honesty, trust and respect. Students are expected to pursue knowledge with integrity.

Violations of the Academic Honesty Guidelines shall result in judicial action and a student being subject to the sanctions in paragraph XIV of the Student Code of Conduct. The conduct set forth hereinafter constitutes a violation of the Academic Honesty Guidelines (University of Florida Rule 6C1-4.017). You may find the Student Honor Code and read more about student rights and responsibilities concerning academic honesty at the link https://www.dso.ufl.edu/sccr/.

Students with Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting: https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester. If a student does not supply the appropriate documentation in a timely fashion, the instructor may not be able to accommodate the student in a timely manner.

Calendar

May

Sun	Monday	Tuesday	Wednesday	Thursday	Friday	Sat
9	10 First Day of Class **Lecture:** Explore Canvas	11	12 **Lecture:** On the merits of video recording for yourself.	13	14 **Lecture:** Riemann Integral Notations: §6.1 p241-243	15
16	17 **Lecture:** Formal Riemann Integral: §6.1 p244-245	18	19 **Lecture:** Some Types of Integrable functions: §6.2	20	21 **Lecture:** Suggested Problems: 6.1.(2,4,8,9), 6.2.(1, 11-13).	22
23	24 **Lecture:** Properties of Riemann Integral §6.3	25	26 **Lecture:** Suggested Problems: 6.3.(1a, 2, 4, 6, 7a, 10, 17)	27	28 **Lecture:** FTC §6.4	29
30	31 **Memorial Day**					

June

Sun	Monday	Tuesday	Wednesday	Thursday	Friday	Sat
		1	2 **Lecture:** Integration Techniques §6.4	3	4 **Lecture:** Suggested Problems: 6.4.(3,4,11,13)	5
6	7 **Lecture:** Improper Integration: §6.5	8 HW 1 Due	9 **Lecture:** Absolutely Improperly Integrable §6.5	10	11 **Lecture:** Suggested Problems: 6.5.(1,2,3a-b,4,13,15)	12
13	14 **Lecture:** Infinite Series §7.1	15 **First Midterm Assigned** Topics: §6.1-6.5	16 **Lecture:** Infinite Series Convergence Tests pt 1 §7.1	17	18 **Lecture:** Suggested Problems: 7.1.(1,4,6,10,11,16,22)	19
20	21 **Summer Break**	22 **Summer Break**	23 **Summer Break**	24 **Summer Break**	25 **Summer Break**	26
27	28 **Lecture:** Infinite Series Convergence Tests p2 §7.2	29	30 **Lecture:** Infinite Series Convergence Tests p2 §7.2			

July

Sun	Monday	Tuesday	Wednesday	Thursday	Friday	Sat
				1	2 **Lecture:** Suggested Problems: 7.2.(1,3,-5,7,9,15)	3
4	5 **Lecture:** Ratio Test §7.3	6	7 **Lecture:** Root Test §7.3	8 HW 2 Due	9 **Lecture:** Suggested Problems: 7.3.(1-13; odd)	10
11	12 **Lecture:** Absolute Convergence §7.4	13	14 **Lecture:** Conditional Convergence §7.4	15 **Second Midterm Assigned** Topics: §7.1-7.4	16 **Lecture:** Suggested Problems: 7.4.(1-13; Fibonacci,11,14,16)	17
18	19 **Lecture:** Sequences of Functions §8.1	20	21 **Lecture:** Pointwise Convergence §8.1	22	23 HW 3 Due	24
25	26 **Lecture:** Uniform Convergence pt 1: §8.2	27 **Final Exam Assigned** Cumulative	28 **Lecture:** Uniform Convergence pt 2: §8.2	29	30	31

August

Sun	Monday	Tuesday	Wednesday	Thursday	Friday	Sat
1	2 **Lecture:** Properties of Uniform Convergence §8.3	3 **Final Exam Due** Cumulative	4 **Lecture:** Properties of Uniform Convergence §8.3	5	6 **End of Semester**	7
8	9	10	11	12	13	14