

Real Analysis

Math 443 — Spring 2018 — Michael Penn

MWF — 9:00-9:50am — Legget 620

- **Instructor:**
 - Michael Penn
 - Martin Science 413
 - mpenn@randolphcollege.edu
- Tuesday, Thursday 9:30am-12:00pm
- By Appointment
- Feel free to drop by my office whenever I am in – which is a lot. Most likely I will be free to help.

- **Office Hours:**

Textbook:

- Understanding Analysis, Second Edition by Stephen Abbott

Course Description:

A rigorous study of limits, continuity, differentiation, and integration of functions of a real variable. Hours credit: 3. Prerequisite: Mathematics 250 or permission of the Department.

Course Structure:

The method of delivery of the course material will vary wildly depending on exactly what we are covering during a given class meeting. Some days will be mostly lecture based while other days will include a lecture and a planned group work assignment. At times we will spend class time in groups working through the material using a “discovery” method. By using all of these different methods the course will hopefully never be dull and everyone will have the chance to learn in their own style.

Assignments:

- **Problem Sets:** We will have homework problems that go along with every class day. Homework from the previous week will be due each Tuesday at noon. You will be required to type-set your assignments using LaTeX – which we will cover during the first week of class. My suggestion is to either download a LaTeX distribution for your computer, sign up for a free online compiler such as overleaf, or use LaTeX on one of the College’s computers.
- **Reading:** Reading assignments will be made alongside the homework and will be used to free up class time for presentations and group exercises.
- **Presentations:** There will be two student presentations to start every class. These presentations will cover information from the previous day and count toward your participation grade. In order to earn full points for presentations you will need to arrive prepared and present your “fair share” of topics. Here is a link to a sign-up spreadsheet:

goo.gl/trPji4

- **Final Project and Paper:** Each student will choose a topic from the text that we did not cover to give a longer form final presentation and write a paper. Specifics will be covered in class.

Exams:

There will be a take-home Midterm (TBA) and a Final during Final’s week.

Group Work:

Though we will not use in class group work every class, we will fairly often. The purpose of this group work is to engage you in collaborative problem solving. A portion of your grade will be determined by how well you participate in these groups. I have borrowed some guidelines for working in groups from Professor William Barker from Bowdoin College. These are essential so that we may get the most out of our class time.

1. **Work together** to achieve groups solutions to the class problems, do not work separately in your own notebook and then present finished work at the board. Listen to each other; the group is more than the sum of its parts.
2. **Use the board:** it is the best way to achieve effective collaborative work. As soon as work begins on a particular question someone should go to the board and
 - (a) write down the question
 - (b) draw a picture (if appropriate) to represent the items under study.

Then, if attempting to probe a result, any “obvious” lines of attack should be started. All work should go through the person at the board.

3. **Rotate board duty** throughout the group. Everyone needs this experience.
4. **Insist on understanding.** Make sure everyone understands what is being discussed. If you are confused, then speak up - never hang back. If someone else is confused, then offer assistance - but remember that simply giving the answer to a problem is usually not the best way to help a person’s understanding.
5. **Contribute, don’t overwhelm.** Avoid the extremes of being overly passive or overly dominate. Everyone must participate in the group.
6. **Keep good notes!** You will see important ideas during group work that you may want to review later.
7. **Don’t give away answers.** Topics may arise about which you have more knowledge (perhaps from another course) than your group mates. In such case you must temporarily change your relationship to the group from student to “resource person”, acting somewhat like an instructor. *Do not simply give out the solution to the problem at hand* - this would steal from your group members benefit of self-discovery, and you would lose the benefits of seeing a solution develop through the minds of other people.
8. **Seek understanding, not speed.** Don’t worry about the pace of other groups. Speed has little correlation with how “smart” a group is. Many a “slower” group simply sees more in the given problems or examines details in greater depth.

Rough Schedule:

Week of	Sections
Week 1	Review of proof writing & introduction to LaTeX
Week 2	Chapter 1
Weeks 3&4	Chapter 2
Week 5	Chapter 3
Weeks 6&7	Chapter 4
Weeks 8&9	Chapter 5
Weeks 10&11	Chapter 6
Weeks 12&13	Chapter 7
Week 14	Final Project Presentations

Grading:

The exact scores that determine letter grades will be determined based on class performance. I expect these to be fairly similar to the standard (90%-100%)A, (80%-89%)B, and so on. The breakdown of grading is as follows:

- Class Participation(including attendance, group work, and presentations): 20%
- Homework: 20%
- Midterm Exam 20%
- Final project and paper: 20%
- Final Exam: 20%

Attendance Policy:

You are expected to attend all class meetings. Excessive absences will result in a lowering of the participation component of your grade.

Electronics Policy:

Other than an electronic calculator, the use of electronic devices is prohibited in this course unless explicitly granted for special assignments. An exception for the use of a cell phone may be made by prior arrangement with me under special circumstances. Other than that, any use of a cell phone, lap-top computer, or other electronic device will be treated as an honor code violation. As per Randolph College policy, all cell phones must be placed in the basket at the front of the room during testing.

Support Services:

Randolph College is committed to providing learning experiences that are accessible for all students, and will make reasonable accommodations for individuals with documented disabilities. If you have a learning difference or a disability mental health, medical, or physical impairment please contact Diane Roy, Coordinator of Disability Services, in the Academic Services Center, 4th floor, Lipscomb Library; at (434) 947-8132; or at droy@randolphcollege.edu.

Mandatory Reporting:

At Randolph College, all College faculty are mandated reporters. In the event that you choose to write or speak about having experienced sexual violence, including rape, sexual assault, sexual harassment, intimate partner violence, or stalking and specify that this violence occurred while you were a Randolph student, I must inform the Colleges Title IX Coordinator, Sharon Saunders We do this to make sure you are able to get all the information and support you need. I understand you may not be interested in making a complaint at this time; however, I am required to report what you confide in me.