

Math 347, Section B1

Fundamental Mathematics

B1: MWF, 9-9:50a, 241 Altgeld

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Office: 230 Illini Hall

Office Hours: TBD

The contents of this syllabus are subject to change at anytime during the semester.

Course Description: Fundamental ideas used in many areas of mathematics. Topics will include: techniques of proof, mathematical induction, binomial coefficients, rational and irrational numbers, the least upper bound axiom for real numbers, and a rigorous treatment of convergence of sequences and series. This will be supplemented by the instructor from topics available in the various texts. Students will regularly write proofs emphasizing precise reasoning and clear exposition.

Credit Hours: 3

Text(s): *Mathematical Thinking*, 2st Edition

Author(s): D'Angelo and West

Grade Distribution:

HW	20%
Midterm Exams	15% each
Final Exam	33%
Participation	2%

Exam Dates:

Exam 1	October 5
Exam 2	November 9
Exam 3	December 7
Final Exam	TBA

Course Policies:

- **Grades**

- We will be using Moodle for this course. Please let me know of discrepancies in your grade as they appear throughout the term.

- **Assignments**

- Homework will typically be assigned every week on Friday and due the following Friday.
- No late homework will be accepted. However, I will drop the lowest Homework grade.
- You are permitted, and in fact encouraged, to discuss homework problems with your fellow classmates. However, the solutions you submit **must** be written in your own words. Copying another students' solution will be regarded as plagiarism.

- **Exams:**

- All exams will be closed book and closed notes. The use of calculators or other electronic devices is not permitted.
- There will be no make up exams. If you have a conflict, you must let me know ahead of time so that we can come to a satisfactory arrangement.
- There will be three midterm exams, each will be 50 minutes and given in class.
- The final exam must be given at the officially assigned Final Exam slot provided by the University. In particular, a student is not permitted to take an earlier exam to accommodate travel plans. The final exam schedule will be made public on October 4, so make travel plans after this date.
- I will not accept illegible, messy, or incoherent work on your exams. Such work will result in a zero for that problem. This class emphasizes proofs and logical coherent communication of mathematical ideas. As such, the solutions you give must be legible and logically organized. If I have to guess the correct order of the points in your argument, then it will likely get a zero.

- **Homework Guidelines**

- Mathematics (and problem solving in general) is a collaborative discipline. You are strongly encouraged to work in groups and to discuss homework problems with your classmates. However, you must write-up the solution on your own and it must be in your own words. Anything else is plagiarism and will be treated as such.
- This is class where you learn proofs, this means you should pay special attention to the structure the proofs you write for your assignments. It is important that you clearly identify all assumptions and write *all* of the logical steps you use in a clear linear fashion. Furthermore, your writeup should be concise, if a sentence you write does not advance the readers understanding of your argument, then it does not belong there.
- Remember, a proof is supposed to convince others that a certain statement is true. Keep this in mind when writing your proofs. A good way to check your solutions is to ask yourself whether or not you are convinced by your own argument, especially if its been several days since you wrote your proof.

- **Attendance and Absences**

- Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

- **Participation:**

- You can receive participation credit (contributing 2% to your grade) if you participate in class and/or frequently come to my office hours to genuinely engage in the class material. Every other Friday during the semester, I will hand out a worksheet and I expect you to participate in the class discussion during this time; this also contributes to your participation grade. However, if you obtain a 97% or higher on your final exam, you will also receive the participation credit.

- **Students with disabilities:**

- Students with disabilities who require accommodations should see me as soon as possible. In particular, any accommodation on exams must be requested at least a week in advance and will require a letter from DRES.

- **Academic integrity:**

- Cheating is taken very seriously, so please don't do it. Penalties for cheating on exams, in particular, are very high, typically resulting in a 0 on the exam or an F in the class.

Tips for Success (in math classes in general): Reading and learning mathematics takes a great deal of time and effort, and there is no shortcut to understanding the material. The following are some good habits to develop for learning mathematics.

- Give yourself plenty of time to think about the problems, examples, definitions, and ideas from the course, and think about them often. It takes time to become comfortable with the material. Another great way to study is to arrange a study group where you and your friends present proofs to each other on the blackboard!
- When doing your reading assignments, or reviewing the material, it is a good idea to try and prove the various statements on your own, referring to the textbook or your notes only when you truly get stuck. This can be done before and after your reading assignments.
- Make sure you understand the definitions. This implies being able to give an example and indicating the conceptual idea behind the definition. Having pictures in mind can also be helpful. When learning definitions at first, I highly recommend reading the definition, and then writing it down by hand in your own words.
- Discuss the material with me, or even better, with your fellow classmates. Very often, two people have different ways of understanding the material. Discussing with your classmates will not only clarify and improve your understanding, but enrich it as well.
- Take advantage of office hours!
- Ask yourself questions, and try to answer them. If you can't, come to office hours.
- While a student myself, I always enjoyed the following quote of Paul Halmos:

Don't just read it; fight it! Ask your own questions, look for your own examples, discover your own proofs. Is the hypothesis necessary? Is the converse true? What happens in the classical special case? What about the degenerate cases? Where does the proof use the hypothesis?