

This Course May Be Different From Your Previous Math Courses: Introduction to Analysis may be one of your first upper-level courses requiring proof writing. As a result, there may be more emphasis on Thinking, Communicating, and Understanding than you may have experienced in prior math courses. Also, you may be expected to do mathematics in a more sophisticated way than you have in the past, and there may be much more emphasis on concepts and ideas than on numerical calculations. A major goal of the course is for you to become increasingly comfortable with writing proofs.

Some differences you will encounter:

- You will be expected to write mathematical proofs, and hence there may be significantly more writing in this course compared with other math courses you have taken. In addition to requiring mathematical arguments, your proofs will require proper spelling, grammar, punctuation, and English usage.
- Frequently, solutions in this class will not involve finding a number or doing a calculation. Instead, solutions will require you to provide a convincing argument that a statement is true or false.
- There will be more focus on theory and abstract ideas, and less focus on computation.
- There is more of an emphasis on asking “Why?” and justifying answers.
- You will be required to understand, not simply to reproduce.
- There is more of an emphasis on communicating ideas in both writing and speaking.
- There will be emphasis on using language precisely. One consequence of this is that there will be numerous definitions, many of which you will need to memorize.
- There will be a great deal of new notation introduced, which you will need to be familiar with. In many ways learning this new notation is like learning a new language.
- There will be many more concepts introduced than you have seen in earlier math courses, and these concepts will be introduced at a faster pace.
- You will be expected to use basic mathematical logic.

What will you have to do differently to be successful?

The best thing you can do is be prepared for a new level of expectations. Expect that you may have to adapt your work habits and style of studying.

- **WORK DIFFERENT.** You may have to study in ways you’ve never studied in a math class. For example: read the textbook, review your notes after every class, memorize definitions, understand theorems and proofs.
- **WORK LONGER.** You may need to put in more time than in past math courses. For example: more hours on homework, attending *every* class, more work on your own (rather than working solely in study groups), coming to office hours regularly. (Remember that unlike lower level courses, in upper level courses it is often the best students who come regularly to office hours).
- **WORK HARDER.** You may have to study in ways that are mentally uncomfortable or require hard work. For example: identify your weak points and practice the related topics, learn *all* the different ways of thinking about something, learn to ask questions, take greater responsibility for your own learning.
- **WORK SMARTER.** When you spend time working on this class, make sure it is benefiting you. For example: Work all homework problems and don’t skip ones you don’t understand. Try the problems on your own before looking at solutions or working with others. If you miss points on homework or exams learn how to do those exercises correctly as soon as possible.

Note: Also see the handout “Expectations of Higher Level Math Courses”.