

Math 104: Introduction to Analysis

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Office Hours: Tuesdays and Thursdays 2:00-3:00 PM, and by appointment.

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Office Hours:

Meeting Time: Tuesdays and Thursdays 9:30-11:00 AM in Cory 247

Required Text: *Elementary Analysis: The Theory of Calculus*, 2nd ed., by Kenneth A. Ross.

Course Description:

The goal for the semester is to learn, understand and be able to work with the main ideas of analysis, including limits and continuity, sequences and series of numbers, sequences and series of functions, differentiation, and Riemann integration. We shall also stress the importance of reading and writing rigorous proofs.

Homework:

There will be weekly homework assignments due on Thursdays. They will be posted on bCourses one week prior to their due date. They should be turned in at the beginning of class on Thursday. No late homework will be accepted. However, your two lowest homework grades will not be included in the final grade calculation.

Discussing the problems with other students is highly recommended and encouraged, but each student must write his/her own solutions. Copying solutions, either from other students or from the internet or any other source, will be considered cheating. A general rule is that talking about problems or explaining ideas is acceptable, but reading another student's solution is not.

It is expected that you turn in a final draft of your homework. This means, that it should be written neatly or typed, using complete sentences, and citing the necessary results from the textbook or previous homework assignments. It is your responsibility to make it as easy as possible for the grader to understand you.

Exams:

There will be two in class midterm exams on September 27 and November 1. According to the University's Fall 2018 Final Exam Calendar Guidelines, the final exam for your course is expected to be at 3:00-6:00 PM on December 11th, based on the start time of the class. If there are any conflicts with the schedule please inform me as soon as possible but prior to the second weeks of the semester.

Grades: Your final grade will be computed as follows:

| | | |
|-----------------------|------------------|-----|
| Homework | every week | 20% |
| Midterm Exam 1 | Thursday Sept 27 | 20% |
| Midterm Exam 2 | Thursday Nov 1 | 20% |
| Final Exam | Tuesday Dec 11 | 40% |

Note to students:

Learning mathematics takes time and consistent effort. Regular class attendance, completing homework assignments, and reading class notes/textbook before every class is essential for success in this course for most students. Never hesitate to seek extra help when you need it.

Tentative Schedule:

| Week | Date | Section | Topic |
|------|---------------|----------|---|
| 1 | Aug 23 | 1 - 3 | Basic notation and properties of $\mathbb{N}, \mathbb{Q}, \mathbb{R}$ |
| 2 | Aug 28, 30 | 4-5, 7-8 | Completeness Axiom, $\pm\infty$, sequences |
| 3 | Sept 4, 6 | 9-10 | Properties of sequences |
| 4 | Sept 11, 13 | 11-12 | Subsequences, \limsup and \liminf |
| 5 | Sept 18, 20 | 14 -15 | Introduction to series, alternating series and integral tests |
| 6 | Sept 25, 27 | | Review and Midterm Exam 1 |
| 7 | Oct 2, 4 | 17-18 | Continuous functions |
| 8 | Oct 9, 11 | 19-20 | Uniform continuity and limits of functions |
| 9 | Oct 16, 18 | 28-29 | Differentiation and the Mean Value Theorem |
| 10 | Oct 23, 25 | 32-33 | Riemann Integral and properties of Integrals |
| 11 | Oct 30, Nov 1 | 34 | Fundamental Theorem of Calculus, Midterm Exam 2 |
| 12 | Nov 6, 8 | 23-24 | Power series and uniform convergence |
| 13 | Nov 13, 15 | 25-26 | Differentiation and Integration of power series |
| 14 | Nov 20 | | Metric spaces, open and closed sets |
| 15 | Nov 27, 29 | | Compactness, sequences in metric spaces |
| 16 | Dec 3-7 | RRR week | |
| 17 | Dec 11 | | Final Exam 3:00-6:00 PM (expected) |