

Syllabus MATH 301/571, Introduction to Mathematical Analysis

Fall 2023-2024

1 Instructor

Gökalp Alpan
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Office: FENS 1015
Office hours: Wednesday 10:40-11:30

2 Schedule

Tuesday 15:40-16:30 (FENS L062)
Thursday 10:40-12:30 (FENS L045)
Recitation: Thursday 16:40-17:30 (FASS G018)

3 Recommended books

(Textbook) Michael C. Reed, *Fundamental Ideas of Analysis*, John Wiley & Sons, Inc., 1998. We will cover the first 6 chapters, we will skip some sections. Detailed weekly schedule is at the end of the syllabus.

Walter Rudin, *Principles of mathematical analysis*. 3rd ed. McGraw-Hill Book Co., New York-Auckland-Düsseldorf, 1976

Stephen Abbott, *Understanding Analysis*, 1st edition, Springer, 2002.

4 Grading

There will be 6 homework assignments of which the best 5 will be taken (30%), a Midterm exam (30%) and a final exam (40%). The schedule of these exams will be announced on the course website.

5 Homework

Homework assignments are based on the lectures and will be posted on the SU-course website sometime on Thursday. That assignment will be due in two week on Thursday at the beginning of the lecture. You are encouraged to do your homework in groups. You are required, however, to write up your homework on your own. Homework is an essential educational part of this course. Your work

will be graded mostly on your ability to work problems on exams. You cannot work problems on midterm exams if you have not practiced the techniques within the homework problems. If you misuse homework by not doing it yourself, or not checking that you can solve a problem on your own after having been shown how to do it, then your exam scores and corresponding grade will reflect this.

6 Attendance

You are expected to attend every class. If you miss a class, it is your responsibility to obtain a copy of the lecture notes from another student. You are also responsible for any announcements about changes to the course schedule, the exam schedule, or the course requirements made during that class.

7 Academic Honesty

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Cheating hurts our community by undermining academic integrity, creating mistrust, and fostering unfair competition. The university will punish cheaters with failure on an assignment, failure in a course, permanent transcript notation, suspension, and/or expulsion.

Violations can include cheating on exams, plagiarism, reuse of assignments without permission, improper use of the Internet and electronic devices unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Ignorance of these rules is not an excuse.

In this course, as in many math courses, working in groups to study particular problems and discuss theory is strongly encouraged. Your ability to talk mathematics is of particular importance to your general understanding of mathematics.

You should collaborate with other students in this course on the general construction of homework assignment problems. However, you must write up the solutions to these homework problems individually and separately. If there is any question as to what this statement means, please see the professor or the recitation instructor.

8 Tentative course schedule

Midterm: November 25th, Saturday, 12:00-14:00

Week 1: Sections 1.1-1.4 (Preliminaries)

Week 2: Sections 2.1-2.3 (Sequences)

Week 3: Sections 2.4-2.6 (Sequences)

Weeks 4-6: Chapter 3 (Continuity, Riemann Integrals, Discontinuities, Improper Integrals)(excluding numerical methods)

Week 7: Sections 4.1, 4.2(Differentiation)

Week 8: Sections 4.3, 4.5 (Differentiation)

Week 9: Sections 5.1, 5.2 (Sequences of functions)

Week 10: Sections 5.3, 5.6 (Supremum norm, metric spaces)

Week 11: Sections 5.6, 5.7 (Metric spaces, contraction mapping principle)

Week 12: Sections 6.1, 6.2 (lim sup, lim inf, series)

Week 13: Sections 6.2, 6.3 (series, Weierstrass M-test)

Week 14: Section 6.4 (power series), Review.