

Math-571 Introduction to Mathematical Analysis

Instructor: Turgay Bayraktar

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Office: FENS 1013 **Office Hours:** Thurs 2.40pm-3.30pm (over Zoom) or by appointment.

Textbook: Fundamental Ideas of Analysis (1998); M. Reed, Wiley and Sons Inc.
ISBN:0-471-15996-4.

Supplementary Reading: Principles of mathematical analysis 3rd ed. ; W. Rudin, McGraw-Hill Inc. ISBN:0-07-054235-X

Physical Lectures: Mon 8.40am-9.30am FASS G062 & Wed 2.40pm-4.30pm in FASS G062

Zoom Link for lectures: <https://sabanciuniv.zoom.us/j/92533259804>

Recitation: Fri 5.40-6.30pm (Online) **Teaching Assistant:** Çiğdem Çelik

Zoom Link for recitations:

Content: The least upper bound property in \mathbb{R} , equivalents and consequences. Metric spaces. Completeness, compactness and connectedness. Functions and continuity. Sequences and series of functions. Contraction mapping theorem and applications to calculus. Inverse and implicit function theorems.

Course Policies: Lecture can be followed either physically in class or online over zoom. Students are free to choose one of these cases. However, attendance for both cases is expected and strongly encouraged. You are responsible for lecture notes, any course material handed out in class. You are responsible for lecture notes, any course material handed out in class. No cell phones, pagers nor laptops are allowed during the lectures. I strongly encourage active participation in the classroom. This way I can clarify the difficulties that you have about the course material.

Grading Policy: There will be bi-weekly homework sets, approximately 6 assignments of which the best 5 will be taken (30%), one Midterm exam (30%) and a final exam (40%). The schedule of these exams will be announced on the course website.

Homework: Homework assignments are based on the week's lectures and will be posted on the SU-course website sometime on Wednesday. That assignment will be due in two week on Wednesday 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.

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.

For more information, see the guide on the SU website (http://mysu.sabanciuniv.edu/yonerger/Akademik_durustluk/E-Investigation.html).

Tentative course schedule

Date	Sections
Week 1	Preliminaries 1.1-1.2-1.3-1.4
Week 2	Sequences 2.1-2.2-2.3
Week 3	Sequences 2.4-2.5-2.6
Week 4	Continuity 3.1-3.2
Week 5	Riemann Integral 3.3-3.5
Week 6	Improper Integrals 3.6, Review
Midterm	
Week 7	Differentiation 4.1-4.2-4.3
Week 8	Differentiation 4.4-4.5-4.6
Week 9	Sequences of Functions 5.1-5.2
Week 10	Metric Spaces 5.3-5.6-5.7
Week 11	Series of Functions 6.1-6.2
Week 12	Series of Functions 6.3-6.4
Week 13	Power Series 6.4 and Review
Week 14	Review
Final Exam	