

MATH 419 – Measure Theory - Fall 2026

Instructor: Gökhan Benli (Email: benli (at) metu.edu.tr Office: M227)

Web page: <https://blog.metu.edu.tr/benli/math-419-measure-theory-fall-2026/>

(I will try to keep a weekly blog on this website)

Office hours: Tuesday 8:40-10:30 or by appointment via email.

Schedule: Tuesday 13:40-14:30, Thursday 10:40-12:30 Classroom: M102

Catalog description: Measurable spaces and functions. Measures. Integration with respect to a measure. Integrable functions. L^p spaces. Modes of convergence. Generation of measures. Product measures. Decomposition of measures.

Textbook: The class notes for this course will be self-contained and will not follow a book strictly. (I will share class notes of each week's courses with the students). Here is a list of books I am planning to use while preparing the lecture notes:

- R.G. Bartle, *The Elements of Integration and Lebesgue Measure*
- Soo Bong Chae, *Lebesgue Integration*, Second Edition
- Terence Tao, *An Introduction to Measure Theory*
- Sheldon Axler, *Measure, Integration & Real Analysis*
- Gerald B. Folland, *Real Analysis, Second Edition*

Exams: TBA

Grading: There will be **two** midterms and a final exam (each 100 points).

Your total grade will be calculated by the following formula:

$$\text{Total grade} = (\text{Midterm 1} + \text{Midterm 2}) \times 0.3 + \text{Final} \times 0.4$$

Attendance, NA and Final Entrance Policy:

- I will take regular attendance.
- If your attendance is below 70% **AND** your two midterm scores add up to **less than 130 points**, then you shall not be able to take the final exam and get an NA grade. (If you miss one midterm and have an official excuse for the makeup, your midterm score must be at least 65 if your attendance is below 70%).
- If your two midterm scores add up to **less than 25 points**, then you shall not be able to take the final exam and get an NA grade.
- If you miss more than one exam, then you shall not be able to take the final exam and get an NA grade.

This policy will be strictly enforced and is not up to discussion.

Make-up policy: There will be only one makeup exam at the end of the semester. No make-ups will be given without an official report.

Tentative schedule (The table below is a rough guideline for the content of course lectures. The lectures may be reordered or reorganized if necessary.)

The chapters are taken from: R.G. Bartle, *The Elements of Integration and Lebesgue Measure*

	Date	Topics
Week 1	September 28	Introduction, Measure Spaces (Chapter 1 and Chapter 3)
Week 2	October 5	Measures, outer measures (Chapter 3, Chapter 12)
Week 3	October 12	Measurable Sets (Chapter 13)
Week 4	October 19	Measurable Functions (Chapter 2)
Week 5	October 26 (Th. Oct. 29 No classes)	Integration with respect to a measure (Chapter 4)
Week 6	November 2	Integrable Functions (Chapter 5)
Week 7	November 9	Integrable Functions (Chapter 5)
Week 8	November 16	The Lebesgue spaces L^p (Chapter 6)
Week 9	November 23	Modes of Convergence (Chapter 7)
Week 10	November 30	Modes of Convergence (Chapter 7)
Week 11	December 7	Generation of measures (Chapter 9)
Week 12	December 14	Generation of measures (Chapter 9)
Week 13	December 21	Product Measures (Chapter 10)
Week 14	December 28	Decomposition of measures (Chapter 8)

Academic dishonesty policy: You are expected to be familiar with the university's [academic integrity guide](#) for students. No form of academic dishonesty is tolerated. If you are caught cheating, then you will fail the course **and** official disciplinary action may be pursued.

Information for students with disabilities: To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course coordinator and the METU Disability Support Office as soon as possible. For further information, visit the web site <http://engelsiz.metu.edu.tr>.

Policy regarding the use of Gradescope in exam evaluations: Your instructors will use the [Gradescope](#) software (which is purchased officially by the METU administration) to grade your exam papers. This means that your exam paper will be scanned and uploaded to the Gradescope system. This system allows you to see your graded exam paper and the grading process in a transparent and useful manner. If for some reason you do not want your exam paper to be graded using this system, you are obliged to notify the course coordinator **not later than October, 10 2026**. Note that in this case, you will have limited time to see your graded exam paper.