

MATH 111 – Fundamentals of Mathematics - Fall 2020
Course Syllabus (TENTATIVE as of 5.10.2020)

This is Math 111 Syllabus for the Fall 2020 Semester.
Each student is responsible from the information listed here.

Course Website: <http://ma111.math.metu.edu.tr/> (All students must regularly visit this page)

Instructors: Gökhan Benli (benli (at) metu.edu.tr)
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(Any questions regarding the course and registration can be sent to **benli (at) metu.edu.tr**, with **MATH111** in the title)

Course description:

The main goal of this course is to enable the student to comprehend and construct mathematical arguments, as well as to develop the student's mathematical maturity by providing basic definitions, facts and necessary tools. It is to your advantage to learn how to write mathematics as early as possible. If you do well in this course, then it is very likely that you will have no trouble in the rest of your education in the mathematics courses.

Classes: Monday 11:40-12:30
Wednesday: 13:40-15:30
(Optional recitation) Thursday 12:40-13:30

These times are the common class times **FOR ALL SECTIONS** of Math 111.

The classes will be done online via the Zoom platform. Before each class, the Zoom link will be sent to your METU email address. These lectures are intended for Math 111 students and sharing the link with third parties is strictly forbidden. The video recording and lecture notes of each lecture will be posted on Odtüclass, so that you have a chance to watch it again. Sharing the links to the videos with third parties is strictly prohibited.

Office Hours: See the office hours section of the web page for the office hours of your instructors. Note that the times of office hours may change. The office hours will be done online over Zoom.

Textbooks:

- The official textbook of the course is

Proofs and Fundamentals: A First Course in Abstract Mathematics, Second Edition, Ethan D. Bloch

It can be officially downloaded from Springer's website <https://link.springer.com/book/10.1007/978-1-4419-7127-2> if you are connected to the internet through the university. (You can use the METU VPN service <https://faq.cc.metu.edu.tr/groups/vpn-service> to connect via the university.)

- Additionally, the following book will be helpful: *How to prove it*, by Daniel J. Velleman.

Forum: There will be a forum dedicated to Math 111 on Odtüclass. You can use this forum to post your Questions.

Exams:

- There will be 8 online exams (see the weekly course plan for the dates and times).
- The exams will be online on [Odtüclass](#).
- Only the **best 6 exam scores** will be counted, in other words, your **two lowest exam scores** will be discarded.
- If your exam average is **greater than or equal 70 (out of 100)**, you will have the option to take the oral exam.
- If your exam average is **less than 70**, you will **NOT** have the option to take the oral exam

Grading: Grading will be done according to the following scheme:

- If your exam average is **greater than or equal 70**, you will have the option to take the oral exam. Your grade will be determined by your exam average and your oral exam.
- If your exam average is **less than 70**, your grade will be determined by your exam average.
- If you **CAN NOT/DO NOT** take the oral exam, **(even if your exam average is 100)** your letter grade will be **AT MOST CB**.
- The details of the oral exam will be announced later.

Make-up policy: There will be no make-up exams under any circumstance.

Weekly course plan: (Tentative)

W1 - Oct12	Chapter 1: 1.1 Introduction, 1.2 Statements, 1.3 Relations between Statements	
W2 - Oct 19	1.4 Valid Arguments	1.5 Quantifiers
	Exam 1 - Friday October 23, 17:40	
W3 - Oct 26	1.5 Quantifiers	Chapter 2 :2.2 Direct Proofs
	Exam 2 – Friday October 30, 17:40	
W 4 - Nov 2	2.3 Proofs by Contrapositive and Contradiction	
W5 - Nov 9	2.4 Cases, and If and only if	2.5 Quantifiers in theorems
	Exam 3 - Friday November 13, 17:40	
W6 - Nov 16	Chapter 3: 3.1 Introduction, 3.2 Basic definitions	3.3 Set operations
W7 - Nov 23	3.3 Set operations (also notation about families of sets)	Chapter4: 4.1 Functions 4.2 Image and Inverse Image
	Exam 4 - Friday November 27, 17:40	
W8 - Nov 30	4.2 Image and Inverse Image	4.3 Composition and Inverse functions
W9 - Dec 7	4.3 Composition and Inverse functions	4.4 Injectivity, Surjectivity, Bijectivity
	Exam 5 – Friday December 11, 17:40	
W10 -Dec14	Chapter 5: 5.1 Relations, 5.2 Congruence, 5.3 Equivalence relations	
W11- Dec21	Chapter 7: 7.4 Order Relations	
	Exam 6 – Friday December 25, 17:40	
W12- Dec 28	Chp 6: 6.3 Mathematical Induction	
W13- Jan 4	6.5 Cardinality of Sets, 6.6 Finite and Countable Sets	
	Exam 7 – Friday January 8,17:40	
W14- Jan 11	6.7 Cardinality of Number systems	
	Exam 8 – Friday January 15, 17:40	