

Fall 2020

MATH 125, Basic Mathematics I

Frequency: Fall Semester

METU Credit: 4(3-2)

Catalog description: Logic. Relations and Functions. Matrices and determinants. Inverse of a matrix, matrix polynomials, Cayley-Hamilton theorem. Systems of linear equations, parametric solutions. Counting: principle of inclusion exclusion, pigeonhole principle. Mathematical induction, recursive relations. Permutations, combinations. Discrete probability. Graphs.

Course instructor: M. Firat Arıkan

Suggested textbook: M. Dabbagh, A. Doğanaksoy, Basic Mathematics I.
(can be found at Mathematics Department, Room Z23, and will be available online in parts)

Course Webpage: <http://ma125.math.metu.edu.tr/>

Grading Policy: (Also READ [MATH 125 Online Course Policy](#) for more details)

Midterm1: 30 Points (November 16, 2020, Monday - Start at 09:00 am)

Midterm2: 30 Points (December 21, 2020, Monday - Start at 09:00 am)

Final Exam: 40 Points (To be announced later...)

Oral Exam (Optional): 0.4 (see below) (It will be given at the end of the semester)

Letter Grade will be determined as follows:

R = Raw Score taken from written exams (out of 100 Points)
= Midterm1 score + Midterm2 score + Final Exam score

OE = Score taken from Oral Exam (a number between 0.0 and 0.4)

T = Total score = Score calculated by using W and OE (as explained below)

THEN

Option 1: If a student decides to take the Oral Exam, then

$$T = R * (0.6 + OE)$$

Option 2: If a student decides NOT to take the Oral Exam, then

$$T = R * 0.79 \quad (\text{in that case maximum possible letter grade will be CB})$$

In both cases, Letter Grade will be determined by using the number T.

Week	Dates	(Tentative) Syllabus (Math 125) Fall 2020
1	October 12-16	Ch 1: Logic Sets, basic definitions, subsets, power set, set operations.
2	October 19-23	Propositions, truth tables, tautology, contradiction
3	October 26-30	Proof techniques, quantifiers and predicates
4	November 2-6	Ch 2: Functions and Relations Functions: Basic definitions, properties, composition, inverse. Relations: Binary relations, equivalence relations, partition.
5	November 9-13	Special Functions: Polynomial functions, logarithms, exponential functions, elementary trigonometric functions and their inverses, basic properties and graphs, trigonometric identities
6	November 16-20	Ch 3: Matrices Basic definitions, square matrices, operations on matrices ☺Midterm 1 (November 16 2020 Monday at 09:00 am)
7	November 23-27	Inverse of a matrix, determinant of a matrix
8	November 30-December 4	Matrix polynomials, row echelon form of a matrix
9	December 7-11	Ch 4: Systems of Linear Equations Linear equations, systems and their solutions
10	December 14-18	Cramer's method, Gauss elimination method.
11	December 21-25	Ch 5: Counting Mathematical induction, Recurrence relations, solving recurrence relations by iteration, ☺Midterm 2 (December 21, 2020 Monday at 09:00 am)
12	December 28-31	Solving linear homogenous recurrence relations with constant coefficients, recursive functions,
13	January 4-8	The pigeon hole principle, the generalized pigeon hole principle, basic counting rules
14	January 11-15	Permutations, combinations, algebra of combinations, Pascal equality, binomial theorem

☺Final Exam (To be announced later...)