Fall 2021

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. Fırat 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/ and ODTUClass Math 125 webpage

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

Midterm1: 30 Points **(November 22, 2021 Monday - Start at 09:00 am)**
Midterm2: 30 Points **(December 27, 2021, 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 (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 2021
1	October 18-22	Ch 1: Logic Sets, basic definitions, subsets, power set, set operations.
2	October 25-29	Propositions, truth tables, tautology, contradiction Oct 29, Republic Day - National Holiday (Friday)
3	November 1-5	Proof techniques, quantifiers and predicates
4	November 8-12	Ch 2: Functions and Relations Functions: Basic definitions, properties, composition, inverse. Relations: Binary relations, equivalence relations, partition. Nov 10, Atatürk Remembrance Day (Wednesday)
5	November 15-19	Special Functions: Polynomial functions, logarithms, exponential functions, elementary trigonometric functions and their inverses, basic properties and graphs, trigonometric identities
6	November 22-26	Ch 3: Matrices Basic definitions, square matrices, operations on matrices ☺**Midterm 1 (November 22, 2021 - Monday at 09:00 am)**
7	November 29-December 3	Inverse of a matrix, determinant of a matrix
8	December 6-10	Matrix polynomials, row echelon form of a matrix
9	December 13-17	Ch 4: Systems of Linear Equations Linear equations, systems and their solutions
10	December 20-24	Cramer's method, Gauss elimination method.
11	December 27-31	Ch 5: Counting Mathematical induction, Recurrence relations, solving recurrence relations by iteration, ☺**Midterm 2 (December 27, 2021 - Monday at 09:00 am)**
12	January 3-7	Solving linear homogenous recurrence relations with constant coefficients, recursive functions, The pigeon hole principle, the generalized pigeon hole principle,
13	January 10-14	Basic counting rules, permutations, combinations, algebra of combinations, Pascal equality, Binomial theorem
14	January 17-21	Probability

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