

KOM1012 Introduction to Algorithms and Programming Spring 2025

Course schedule: Section 1: Wednesday 10:00 – 11:50
Thursday 13:00 – 14:50

Instructors: Dr. Buse Tacal Uzun – btacal@yildiz.edu.tr

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Assistants: TBA

Course content: Computer environment, built-in functions in programming, algorithm development, fundamental structures in programming, functions, graphics, symbolic programming, sending and receiving data. **Prerequisite:** None

Reference books:

- H. Moore, MATLAB for Engineers, Fifth Edition, Global Edition, Pearson, 2019.
- B. H. Hahn, D. T. Valentine, Essential MATLAB for Engineers and Scientists, 5th edition, Academic Press, MA, 2013.
- E. B. Magrab, S. Azarm, B. Balachandran, J. H. Duncan, K. E. Herold, G. C. Waish, An Engineer's Guide to MATLAB with Applications from Mechanical, Aerospace, Electrical, Civil and Biological Systems Engineering, 3rd edition, Printice Hall, 2011.
- A. Gilat, MATLAB, An Introduction with Applications, 4th edition, John Wiley & Sons, 2011.

Grading and exams: Two short exams, midterm and final exams will contribute to the final grade. The overall grade will be calculated according to the plan below:

Short Exams	20%
Midterm Exam	40%
Final Exam	40%

Lecture and Problem Session schedule: For the first three weeks, we will hold regular lectures four hours per week. Starting with the fourth week, we have problem sessions on Thursday hours, conducted by the teaching assistants.

Week	Wednesday	Thursday
Weeks 1–3	Lecture	Lecture
Weeks 4–14	Lecture	Problem session

Problem sets: Problem sets will be regularly assigned throughout the semester. Most of the problems in the problem sets will be solved by the assistants in the problem sessions. Any problem not solved in the problem session will be given as homework to the students. The homeworks are intended for you to study on your own. They will not be collected or graded.

Short exams: There will be two short exams in this course. They will be held after 16:00, and the dates will be announced. There may be questions similar to the questions in the problem sets.

Software: We will use MATLAB in this course. It is possible to run MATLAB online using a web browser, but we recommend that you install MATLAB locally on your computer. To do this, you should create an account with your university e-mail address on the MathWorks web site. You can visit this page:

<https://www.mathworks.com/academia/tah-portal/yildiz-teknik-universitesi-31239071.html>

MATLAB is a software package with many different “Toolboxes” used in many different areas of science and engineering. In this course, we are going to use Symbolic Math Toolbox, Control Systems Toolbox and Simulink. Make sure you install these toolboxes when you are installing MATLAB. MathWorks releases two MATLAB versions (a) and (b) every year. For example, in 2024, two versions 2024a and 2024b were released. For this course, the version you install is not important. Any version later than 2018 will be enough.

Course outline (tentative)

Week	Date	Content
1	19 – 20 Feb	Introduction to MATLAB environment
2	26 – 27 Feb	Built-in mathematical functions, m-files, user defined input and output
3	5 – 6 Mar	Problem solving, algorithm development, flowcharts
4	12 – 13 Mar	Selection and control structures, if-else and switch-case statements
5	19 – 20 Mar	Loops: for and while statements
6	26 – 27 Mar	User-defined functions, global and local variables
7	2 – 3 Apr	Review and exercises
8	9 – 10 Apr	Midterm Exam
9	16 – 17 Apr	2-D plots in MATLAB
10	23 – 24 Apr	No class
11	30 Apr – 1 May	Data structures
12	7 – 8 May	File input/output operations, Symbolic Toolbox
13	14 – 15 May	Introduction to Simulink and simulation
14	21 – 22 May	Differential equations with Simulink
14	28 – 29 May	Review and exercises