

Programming and Data-structures in MATLAB
Semester A 2019

Lecturer	Dr. Noam Ben-Eliezer
Tutorial assistants	Neta Stern, TBD
Teaching method	lectures and tutorials
Course language	English
Weekly hours	1 hours lectures, 2 hours tutorials
Credits	2 points
Prerequisites	Programming in Python

Course Goals

- To acquire practical experience in programming in MATLAB
- Learn basic data structures, and how to implemente and use them in MATLAB
- Introduction to Object Oriented Programming

Learning Outcomes:

At the end of the course the student should be able to:

- Program in MATLAB at a basic-intermediate level
- Work with the features of MATLAB, including functions, classes, arrays, and matrices.
- Implement and manipulate data structures anc classes in MATLAB.

Weekly schedule:

Week	Topics
1	Overview of basic topics in MATLAB (programming environment etc.) 1D, 2D, and nD arrays and matrices.
2	Matrix manipulations
3	If statements; Forloops; while statements; Debugging and plotting
4	Functions; Scope of variables
5	Cells, structures and Classes
6	Classes – continued
7	Classes – object oriented programming
8	Stacks
9	Queues
10	Double Linked list
11	Hash tables
12	Advanced classes
13	Preparation for the exam

Not in the syllabus:

- Sorting, Sorting Lower Bound, and sorting not based on comparisons
- File manipulations
- GUI
- AVL Trees
- Divide and conquer

Bibliography:

- TBD: MATLAB Book
- TBD: Tutorial websites
 - <https://ocw.mit.edu/resources/res-18-002-introduction-to-matlab-spring-2008/lecture-notes/>
 - http://web4.cs.ucl.ac.uk/teaching/3085/archive/2010/matlab_tutorial/matlab_booklet.pdf
- Introduction to Algorithms, 3rd Edition by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, MIT press, 2009
- תומאס ה. קורמן, צ'ארלס א. לייזרסון, רונאלד ל. ריבסט, מבוא לאלגוריתמים, האוניברסיטה הפתוחה, 1998
- מדריך למידה של האוניברסיטה הפתוחה לקורס מבני נתונים 20433

Final grade:

- Exam: 70% (on the condition that a student gets a mark of at least 60 in the exam).
- Assignments: 30% (excluding 2 lowest graded assignments).