E7: Introduction to Computer Programming for Scientists and Engineers

Course Objectives

E7 is an introductory course on computer programming for lower-division students in science and engineering. The primary goal of the course is to introduce basic computer programming concepts and apply them to computer-based problem-solving methods. The course stresses hands-on computer programming using MATLAB, a powerful high-level programming environment.

Course Format

E7 consists of classroom lectures, computer laboratory sections, and classroom discussions. Faculty instructor delivers lectures and discussions, while student instructors (GSIs) supervise laboratory sections.

Lectures will begin on Monday, June 10 and will be held Mondays and Wednesdays in 1165 Etcheverry Hall, from 9:40 to 11:00 am. Discussions will begin on Friday, June 14, and will be held Fridays in 10 Jacobs Hall from 11:10 am to 12 noon. The discussions will present and discuss the upcoming homework assignments and answer questions.

Laboratory sections will begin on the second week of instruction, starting Tuesday, June 18 in 10 Jacobs Hall. Labs will be held on Tuesdays and Thursdays between 9:10 am to 12 noon.

Course Website

The course website is hosted at https://bcourses.berkeley.edu/. All material, schedules, homework, and communication regarding the course will be handled through this website. Your bCourses account will also give you secure access to your grades and you will be able to communicate with the faculty, GSIs, and your classmates. It is your responsibility to check the E7 bCourses site frequently, as important information about the course will be routinely posted on bCourses.

Teaching Staff

Instructor:

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You are **strongly** encouraged to contact us with technical questions about the course lectures, lab assignments, course project or any other topics you wish. Logistical and administrative questions should be directed to the instructor.

Course Text and Programming Language

There is no required textbook for the course.

We highly recommend you obtain ***the latest release of the Student Version of MATLAB***, which can be obtained for free via UC Berkeley's Software. It can be accessed through software.berkeley.edu. The Matlab software comes with extensive built-in help. Additional help and tutorials can be found on the Mathworks website. Among other things, this website contains documentation, including manuals that you can download for free.

Assignments

There will be 8 assignments in the course. **All assignments must be turned in no later than 11:59 pm on the day they are due**. Assignments will generally be assigned on Thursday nights, and due the following Thursday nights - however there may be some exceptions to the above. Assignments are meant to be worked on both outside of class and during laboratory sections. Here are some important guidelines:

(i)   The procedure for working on your assignments will be explained during the Discussion Session on Friday, June 14. Weekly laboratory assignments will be available for download (generally on Thursday nights) in the form of a PDF file. You need to upload a .zip file containing all of the necessary .m files to bCourses no later than 11:59 pm on the day each assignment is due. Name your zipped file lastname_firstname_hw1 for the first homework, and so on. You can upload this file multiple times until the deadline and only your last uploaded file will be preserved. Further details will be provided in each assignment.

(ii)   **Owing to the compressed time of the class, late assignments will not be accepted under any circumstances**.

(iii)   It is acceptable to discuss with your classmates the material contained in the assignments and to check your answers. However, we require that you complete all assignments on your own. **Copying someone else's work or allowing your work to be copied constitutes cheating, and will result in at least zero credit for the entire assignment, as well as possible disciplinary action (see the Academic Honesty section below).**

Midterms and Final

There will be two 50-minute midterm examinations scheduled for Wednesday, 3 July, from 9.40 am to 10.30 am, and Friday, 26 July, from 11.10 am to 12 noon. There will be a 3-hour final examination on Wednesday, August 14 between 9.30 am to 12.30 pm. You will be required to carry your student ID before entering the examination room. **It is your responsibility to let the instructor know in case of any Exam conflicts well in advance of the exam date.**

Academic Honesty

The student community at UC Berkeley has adopted the following Honor Code: "*As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others.*" Your E7 instructors join you in pledging to adhere to this code.

Please note that copying programming code constitutes cheating and we may deploy software that will detect when code has been copied. Cheating will result in a 0 on the assignment and a possible report submitted to The Center for Student Conduct.

For further details, see the Berkeley Campus Code of Student Conduct at: http://sa.berkeley.edu/student-code-of-conduct.

Grades and Grading

The course grade will be assigned based on the following percentages:

    35 %   Homework Assignments
    15 %   Midterm 1
    15 %   Midterm 2
    35 %   Final

If you find any discrepancies between the issued grades and the grades posted on bCourses, please bring them to the attention of the instructor or one of the GSIs immediately.

Re-grading

If you believe that a problem (of Assignment or Midterm) was graded incorrectly, write a short paragraph outlining your case and send the instructor an email with the title "E7 Regrade Request". You have **one week** from the time you receive your Assignment or Midterm back to submit the regrade request.

E7 Lecture/Discussion Schedule Summer 2019

Lecture	Date	Day	
1	10-Jun	Mon	Course introduction, MATLAB as a calculator, Scripts and cells
2	12-Jun	Wed	One-dimensional arrays, Character strings, Plotting
	14-Jun	**Fri**	**Intro Lab / Discussion**
3	17-Jun	Mon	Two-dimensional arrays, Polynomials
4	19-Jun	Wed	Cell and structure arrays, Tables, Debugging
	21-Jun	**Fri**	**Intro Lab / Discussion**
5	24-Jun	Mon	Relational and logical operators, Conditionals
6	26-Jun	Wed	Loops
	28-Jun	**Fri**	**Intro Lab / Discussion.**
7	1-Jul	Mon	Introduction to functions, user-defined and built-in functions
	3-Jul	**Wed**	**Midterm Exam**
8	5-Jul	Fri	Subfunctions, nested functions, anonymous functions, function handles.
9	8-Jul	Mon	Induction, Recursion
10	10-Jul	Wed	Linear Algebra, Matrices, Solution of linear equations
	12-Jul	**Fri**	**Intro Lab / Discussion**
11	15-Jul	Mon	Linear Programming, Computer Representation, Machine Precision
12	17-Jul	Wed	Least Squares, Regression, Interpolation
	19-Jul	**Fri**	**Intro Lab / Discussion**
13	22-Jul	Mon	Solution of non-linear algebraic equations
14	24-Jul	Wed	Numerical differentiation & integration
	26-Jul	**Fri**	**Midterm Exam**
15	29-Jul	Mon	Modeling and solution of ODEs
16	31-Jul	Wed	Probability & Statistics (Histograms, Normal Distribution)
	2-Aug	**Fri**	**Intro Lab / Discussion**
17	5-Aug	Mon	Time complexity, Sorting and Searching algorithms
18	7-Aug	Wed	Trees and Graphs
	12-Aug	Mon	Review Lecture
	14-Aug	**Wed**	**Final Exam**