ENGR 131: Elementary Computer Programming

Class Schedule: T Th, 1:00-2:15/2:30-3:45
Lab Sessions: By section

Location: Strosacker Auditorium

Instructor: Prof. Richard Kolacinski
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Office Hours: M 3:00 – 5:00 PM, Th 9:00 – 10:00 AM or by appointment

Course Description: Students will learn the fundamentals of computer programming and algorithmic problem solving. Concepts are illustrated using a wide range of examples from engineering, science, and other disciplines. Students learn how to create, debug, and test computer programs, and how to develop algorithmic solutions to problems and write programs that implement those solutions. Matlab is the primary programming language used in this course, but other languages may be introduced or used throughout.

Course Goals: The primary goal of the course is to provide students with the requisite practice and feedback for mastering basic programming skills and introduce them to their application to science and engineering problems.

Course Outcomes:

1. Basic understanding of computers and computation,
2. Basic understanding of computer languages,
3. Basic understanding of Matlab,
4. Basic understanding of Programming,
5. Ability to effectively implement algorithms in Matlab,
6. Ability to debug algorithms and software,
7. Ability to organize software code for modular implementation.

Course Prerequisites: N/A

Textbook(s): Matlab: A Practical Introduction to Programming and Problem Solving, 4th Ed., Stormy Attaway, Butterworth-Heinemann, Oxford, UK, 2017.

Class/Lab/Credit Hours: 3-0-3

Class Policies

Class attendance is highly recommended. Further, full engagement in class activities is expected of all students and thus, unless otherwise directed, the use of laptops, tablets, phones and like devices is expressly forbidden. An updated syllabus/class schedule will be maintained as a posted document on Blackboard. Announcements of schedule changes and special events will be communicated by email.

Homeworks, given in the course outline below, are to be submitted electronically via Blackboard and are due by midnight on Friday of the following week. For example, the first week's assignments, associated with both Tuesday Aug. 30 and Thursday Sept. 1, are due by midnight on Friday Sept. 9. All homework assignments listed in the course outline are from the text book and the number preceeding the radix (decimal point) indicate the chapter and the number following the radix indicated the problem number. Thus, problem 1.16 indicates problem 16 from chapter 1.

Late homework or writing assignments will result in decreased grades on that assignment equivalent to one letter grade per 24 hours unless otherwise stated. If a student has valid reasons for the late submission, the student must present documentation from the Office of Undergraduate Studies to receive consideration.

Students who require accommodations because of disabilities or other circumstances should present documentation from the Disability Resources Office as soon as possible so that suitable accommodations can be made. Please contact Disability Resources in Educational Services for Students (ESS), 470 Sears Building (http://studentaffairs.case.edu/education/disability/). ESS will work with your instructors to ensure that appropriate accommodations are provided.

Academic Integrity Policy

CWRU Policy on Academic Integrity

"*Academic integrity is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating information and/or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting the work of another person, or work previously used without informing the instructor, or tampering with the academic work of other students*."

Plagiarism, or academic dishonesty, whether from printed, unprinted, or digital sources, is a serious violation of ethical conduct and will result in a grade of "F" for the assignment and for the course. **We recommend that you review the University Bulletin:** http://bulletin.case.edu. Plagiarism and teamwork will be discussed during class but if you have specific questions or are unsure when to cite a source, ask the instructors.

Grading Criteria:

10% Homework assignments
15% Quizzes
75% Mid-term examinations (3 @ 25% ea.)
Optional final examination – Can replace lowest mid-term exam score

Course Outline

Date	Reading(s)	Topic	HW
Aug. 30	1.1-4	Introduction, systems of equations	1.16, 1.19, 1.26
Sept. 1	1.5-8,2.1-4	Matlab, variables, expressions	2.8, 2.11, 2.21, 2.27
Sept. 6	3.1-6	Algorithms, Scripts, basic I/O	3.2, 3.10, 3.15

Sept. 8	3.7-8	Modular programming, functions	3.28, 3.30, 3.33
Sept. 13	4.1-3	Control Structures: If-Then-Else	4.2, 4.7, 4.13
Sept. 15	4.4-5	Control Structures: Switch	4.18, 4.24
Sept. 20	5.1-2	Control Structures: For loops	5.5, 5.16
Sept. 22	5.3-4	Control Structures: While loops	5.20, 5.22
Sept. 27		Review	
Sept. 29		***Exam #1***	
Oct. 4	6.1-3	Debugging, program organization	6.4, 6.13
Oct. 6	6.4-5	Functions, scope	6.15, 6.19, 6.22
Oct. 11	7.1-2	Strings, string operations	7.2, 7.5, 7.10
Oct. 13	7.3-4	String expressions	7.22, 7.26
Oct. 18	8.1	Data Structures: Cell arrays	8.3, 8.5, 8.11
Oct. 20	8.2-3	Data Structures: Structures	8.12, 8.18, 8.25
Oct. 25		**Fall Break**	
Oct. 27		Data Structures: Structures	8.28, 8.29
Nov. 1		Review	
Nov. 3		***Exam #2***	
Nov. 8	8.4-5	Sorting	8.30
Nov. 10	9.1-3	File I/O	9.4, 9.12, 9.26
Nov. 15	10.1-2	Functions Redux: Variable argument functions	10.3, 10.7, 10.13
Nov. 17	10.3-4	Functions Redux: Anonymous functions	10.17, 10.20
Nov. 22	10.5	Functions Redux: Recursion	10.26
Nov. 24		**Thanksgiving Break**	
Nov. 29		Review	
Dec. 1		***Exam #3***	
Dec. 6		Special Topics	
Dec. 8		Special Topics	
Dec. 20		***Final Exam***	**3:30 – 6:30 PM**

Reading Assignments:

All reading assignments, unless otherwise indicated/supplied are from the course text book.