AE 030: Computer Programming for Aerospace Engineers

Course Instructor: Dr. Lucia Capdevila

Contact:

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Credit: 2 units

Class Times & Locations:

- Section 07 (Lecture): Thursday 13:30 – 14:20, Engineering Building 339
- Section 08 (Lab): Thursday 15:00 – 17:45, Engineering Building 407
- Section 09 (Lab): Tuesday 9:00 – 11:45, Engineering Building 407

Office Hours & Location: Tuesdays 13:00 – 15:00 & Thursday 10:00 – 12:00, Engineering Building 272E

Pre-requisites: None

Textbooks:

1. MATLAB for Engineers (5th Edition) by Moore
2. C Programming Language (2nd Edition) by Kernighan & Ritchie

Course Description:

Introduction to the fundamentals of programming in MATLAB and C. Topics in MATLAB programming include variables, characters and encoding, vectors and matrices, inputs and outputs, user-defined functions, selection and loop statements, modular programming, debugging, and plotting techniques. Topics in C programming include variables, data types, operators, expressions, statements, inputs and outputs, arrays, functions, arguments, control flow, and program structure.

Course Goals:

Introduce students to:

1. Developing algorithms, pseudocode, and flowcharts

2. Writing, compiling, analyzing, and debugging computer programs in MATLAB and C

3. Applying computer programming in solving aerospace engineering problems

Course Learning Objectives:

Upon successful completion of this course, students should be able to:

1. Develop algorithms, pseudocode, and flowcharts
2. Define and manipulate variables in MATLAB
3. Define, index, and manipulate vectors and matrices in MATLAB
4. Write, compile, analyze, and debug user-defined functions in MATLAB

5. Incorporate selection and loop statements in MATLAB
6. Utilize modular programming to write a program in MATLAB
7. Plot and interpret data in MATLAB
8. Define variables, data types, operators, and expressions in C
9. Define and utilize control flow in C
10. Write, compile, analyze, and debug programs in C
11. Work effectively in teams to define, propose, and solve an aerospace engineering problem utilizing MATLAB programming

Grade Components:

Course Component	% of Course Grade
Quizzes (12):	5 %
Laboratory reports (12):	40 %
Examinations (3):	40 %
Course project (Proposal, Prototype, Final):	15 %

Letter Grade Scale:

≥ 95 %: A+
≥ 90 %: A
≥ 85 %: A-
≥ 80 %: B+
≥ 75 %: B
≥ 70 %: B-
≥ 67 %: C+
≥ 65 %: C
≥ 63 %: C-
≥ 60 %: D
< 60 %: F

Assignments:

- Assignments will be posted on and submitted via Canvas.
- Check assignment details on Canvas for exact due date and time.
- No late submissions will be accepted.

Exams:

- All examinations must be taken in order to receive a passing grade.
- No make-up examinations will be granted without a valid reason and proof.

Course Project:

Students will be working in teams to provide computer-programming support, utilizing MATLAB and/or C, to one of our senior design teams (aircraft or spacecraft teams depending on their interest and the availability of senior projects). Details will be announced during class throughout the semester.

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8/23/18

Grading/Regrades:

Students may request that their work be re-graded if they believe there to be a mistake in the original grading. To do so, please use the "Re-grade Request Form" available on Canvas, and follow the instructions on the form. Please note that a grade change is not guaranteed and that the grade may increase or decrease.

Academic Integrity:

Collaboration is required for team assignments only. Outside of team assignments, all work submitted for grading should be the original work of the student submitting it. Plagiarism and cheating are not tolerated in this class, please inform yourself about SJSU Academic Integrity Policies and consequences for violating such policies. If you are unsure about how to work appropriately with others, please ask, I'll be happy to talk to you about this.

Accessible Education Center (AEC):

If a student needs course adaptations or accommodations because of a disability, or if a student needs special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with AEC to establish a record of their disability." Academic Senate Policy F06-2

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Approximate Class Schedule:

Module	Module Content	Section 07 - Lecture, 13:30-14:20, ENG 339	Section 08 - LAB, 15:00-17:45, ENG 407	Section 09 - LAB, 9:00-11:45, ENG 407	Lecture	Lab
N/A				Tuesday, August 21, 2018		Lab Cancelled
1	**Intro. to programming & MATLAB**	Thursday, August 23, 2018	Thursday, August 23, 2018	Tuesday, August 28, 2018	Lecture 1	Lab 1
2	**Arrays in MATLAB**	Thursday, August 30, 2018	Thursday, August 30, 2018	Tuesday, September 4, 2018	Lecture 2	(Lab 1 Due) Lab 2
3	**Plotting, User Controlled Input & Output in MATLAB**	Thursday, September 6, 2018	Thursday, September 6, 2018	Tuesday, September 11, 2018	Lecture 3	(Lab 2 Due) Lab 3
4	**User Defined Functions in MATLAB**	Thursday, September 13, 2018	Thursday, September 13, 2018	Tuesday, September 18, 2018	Lecture 4	(Lab 3 Due) Lab 4
5	**Logical Functions, Selection Structures in MATLAB & Flowcharts**	Thursday, September 20, 2018	Thursday, September 20, 2018	Tuesday, September 25, 2018	Lecture 5	(Lab 4 Due)
6	**FOR Loops, WHILE Loops, BREAK, & CONTINUE in MATLAB**	Thursday, September 27, 2018	Thursday, September 27, 2018	Tuesday, October 2, 2018	Lecture 6	(Lab 5 Due)
7	**Nested Loops in MATLAB** **&** **Project proposal**	Thursday, October 4, 2018	Thursday, October 4, 2018	Tuesday, October 9, 2018	Lecture 7	**Project proposal**
N/A	**Midterm 1**	Thursday, October 11, 2018	Thursday, October 11, 2018	Tuesday, October 16, 2018	**Midterm 1**	(Lab 6 Due) Lab 7
8	**Intro. to C**	Thursday, October 18, 2018	Thursday, October 18, 2018	Tuesday, October 23, 2018	Lecture 8	(Lab 7 Due) Lab 8
9	**Conditional statements in C**	Thursday, October 25, 2018	Thursday, October 25, 2018	Tuesday, October 30, 2018	Lecture 9	(Lab 8 Due) Lab 9
10	**Loop statements in C**	Thursday, November 1, 2018	Thursday, November 1, 2018	Tuesday, November 6, 2018	Lecture 10	(Lab 9 Due) Lab 10
11	**Functions in C** **&** **Project prototype demo**	Thursday, November 8, 2018	Thursday, November 8, 2018	Tuesday, November 13, 2018	Lecture 11	**Project prototype demo**
N/A	**Midterm 2**	Thursday, November 15, 2018	Thursday, November 15, 2018	Tuesday, November 20, 2018	**Midterm 2**	(Lab 10 Due) Lab 11
N/A	**Thanks Giving Holiday**	Thursday, November 22, 2018	Thursday, November 22, 2018	Tuesday, November 27, 2018	No class	No Lab/ Lab Cancelled
12	**Arrays & Pointers in C**	Thursday, November 29, 2018	Thursday, November 29, 2018	Tuesday, December 4, 2018	Lecture 12	(Lab 11 Due) Lab 12
N/A	Announcements, Project time, and Q & A	Thursday, December 6, 2018	Thursday, December 6, 2018	Tuesday, December 11, 2018	Announcements, Project time, and Q & A	(Lab 12 Due) Lab Cancelled/ No Lab

Final Exams Weeks Schedule:

Module	Module Content	Section 09 - LAB, 07:15-09:30, ENG 407	Section 07 - Lecture, 12:15-14:30, ENG 339	Section 08 - LAB, 14:45-17:00, ENG 407	Lecture	Lab
Final Exams	**Midterm 3** **&** **Final Project Demo**	Thursday, December 13	Thursday, December 13	Monday, December 17	**Midterm 3**	**Final Project Demo**

Schedule Notes:

Please see this semester's academic calendar for important SJSU deadlines

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