ENGR20/CSCI20: MATLAB Programming (*3.0 Units*)

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Office Hours: M/W/F: 10 am – 11 am
M: 1 pm – 2 pm
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Introduction

MATLAB, short for MATrix LABoratory, is an industry standard piece of software in engineering and scientific computing. This course will focus on utilizing this software to solve engineering problems. You will learn how to code in MATLAB, visualize data, create functions and algorithms, and learn how to use code to solve complex problems. This is a late start course, so the material in this course will be given at a slightly faster pace.

Text

I have created a 'textbook' for the course that is an expansion of previous course notes with more examples, practice problems, and suggested Midterm and Final exam study guides and project ideas. I will also have some Zero Cost online textbooks linked for more resources. If you find any resources you find valuable, please share them with me and I will make sure it's available for everyone else as well.

Required Software

This class requires a copy of R2025a (or higher) MATLAB (previous versions work but there may be significant differences in code you see in class and what you can do at home). You can purchase the license for $49.99 at Purchase MATLAB. There is a $99 option, but I mainly only recommend that for MechE and Aero students preparing to transfer, as Simulink is beyond the scope of this class.

Expectations

Programming is not a spectator sport. You can only truly learn the material by working with it and solving problems. This course is also a Hybrid course, with only one meeting a week. As a 3-unit course, the average expected workload outside of class is 9 hours (3 units x 3 hours/unit). This means you should budget approximately 11 hours a week on additional reading and homework. This is an average; some weeks will require less or more. See the course outline below for the projected reading schedule.

SLO's

Student learning outcomes (SLOs) are listed here as a sampling of the types of learning that a student will be expected to master in this course.

- Students will be able to apply a top-down design methodology to develop computer algorithms.
- Students will be able to use MATLAB effectively to analyze and visualize data.
- Students will be able to apply numerical methods techniques in a MATLAB program to analyze and solve engineering-related problems.

Homework and Code Demonstration Days

As it currently stands, with the advent and use of Large Language Models (LLMs), homework has been reduced to suggested practice problems. In spirit of students gaining practice, there will be a lot of code demonstration days in class where you will code something and show me for credit. In addition, there will be weekly quizzes based off the reading, due the Sunday before lecture to ensure you have enough time to see the material before practicing it.

Exams

There will be a midterm and final exam. (Note: Partial credit will be given, so you must show all work.) Exams will be taken in class. There will be a written portion as well as a programming portion to each exam. Exams will be closed notes, with only the help of MATLAB Help documentation. We will discuss this in more detail before the midterm exam. A list of suggested problems and concepts will be in the book provided.

Project This class will have two projects, due at the midterm and final, respectively. There will be a list of possible project ideas in particular chapters in the book.

Evaluation

Weekly Quizzes	5%	**Scale:**	90-100%	A
Assignments	5%		80-89%	B
Exam	30%		70-79%	C
Final Exam	30%		60-69%	D
Projects (2)	30%		Below 59%	F

Attendance This class is an in-person class. Although I will not be taking attendance, there will be quizzes and in class programming demos that are used to make sure you are keeping up with the reading and assignments.

Conduct Please refer to the Catalogue or Student Handbook for Code of Student Conduct.
Cheating is a violation of the Code of Student Conduct and will not be tolerated in class; to do so may result in a grade of "F". It can lead to permanent expulsion from this college. Cheating includes allowing someone to copy from your work.
**You may not use a Calculator that has a Qwerty keypad on the exams.