



ENGR-2304-101CL
Programming for Engineers
Spring 2022
Tuesday, Thursday 09:30AM - 12:20PM

Instructor Information: Tareq Ismail, Ph.D., tismail@com.edu, (409) 833-8772

Student hours and location:

M & W 2pm - 5pm
 T & Th 4:30PM – 5:30PM
 Location: STEAM Bldg. #22, Room 127

Required Textbook/Materials:

Introduction to MATLAB (Introductory Engineering) 4th Edition
 by Delores Etter (Author)
 Publisher: Pearson; 4th edition (August 10, 2017)
 ISBN-13: 978-0134615288

Course Description: Programming principles and techniques for matrix and array operations, equation solving, and numeric simulations applied to engineering problems and visualization of engineering information; platforms include spreadsheets, symbolic algebra packages, engineering analysis software, and laboratory control software. Prerequisite: MATH 1314, minimum grade "C" or better.

Computer requirements:

Processor: Any Intel or AMD x86-64 processor.
 RAM: 4GB RAM.
 Storage: 3GB of HDD space for MATLAB only, 5-8 GB for a typical installation.
 Graphic Card: No specific graphics card is required.

Course Requirements		
1. Engineering Calculations	Solving practical technical problems using scientific and mathematical tools when available and using experience and intuition otherwise.	Linearization – Finding Roots of Functions – Solving Systems of Equations – Optimization
2. Ethics and professionalism	Engineers shall act in professional manners for each employer or client as faithful agents or trustees and shall avoid conflicts of interest and shall build their professional reputation on the merit of their services and shall not compete unfairly with others. Engineers shall act in such a manner as to uphold and enhance	Using their knowledge and skill for the enhancement of human welfare; II. being honest and impartial, and servicing with fidelity the public, their employers and clients; III. striving to increase the competence and prestige of the engineering profession; and IV. supporting the professional and

	the honor, integrity and dignity of the profession.	technical societies of their disciplines
3. Laboratory	Using a consistent five-step methodology for solving engineering problems, the course demonstrates the exceptional computational and visualization capabilities of MATLAB and integrates real-world engineering and scientific examples with solutions and usable code. The discussions, screen captures, examples, and problem solutions have been updated to reflect new version of MATLAB software.	Hands-on experience in Engineering programming.
4. Plotting, dimensioning, brainstorming, decision trees, decision matrices, and P.C. software packages	To know about different types of a MATLAB equations plotting.	A complete understanding of the object should be possible from the MATLAB equation plotting. If the plot can show all details and all dimensions on one drawing, it is ideal. One can pack a great deal of information into a MATLAB plot.

Determination of Course Grade/Detailed Grading Formula: (methods of evaluation to be employed to include a variety of means to evaluate student performance)

ASSIGNMENTS AND GRADING POLICY

Attendance/ class evaluation: 5% + 1% extra credit for class evaluation.
 Textbook Reading, Paper Assignments, quizzes, and/or Homework: 60%
 Midterm: 15%
 Final Exam: 20%

TOTAL 100 %*

*NOTE: All writing assignments must be completed and evaluated in order to pass this course.

GRADING POLICY:

Letter grades will be based on the following scale:

- 87 -100 A
- 70-86.99 B
- 57-69.99 C
- 40-56.99 D
- 0 - 39.99 F

Lab Reports:

- Each student is responsible for submitting a lab report in his/her own words
- Reports must be submitted at the start of class on the scheduled due date. If class is not held as the result of a holiday than submit your report at the start of the next class meeting after the holiday. will not be accepted more than one week late.
- All reports are to be word processed with 1” margins, 1.5 line spacing, and 11-point font size.
- All reports must contain the following sections:
 - ✓ One Cover page – Provide the title of report, Report number, Course number, Department STEAM, College of Mainland and
 - ✓ Introduction – Provide background information regarding the experiment/exercise.
 - ✓ Body – Provide detailed information about the experiment/exercise and the steps performed to reach the desired goal of the experiment/exercise.
 - ✓ Conclusion – Describe the results of the experiment/exercise. Was the desired goal achieved? Explain. What would you change?
 - ✓ Please proofread and spell check before submitting.

Late Work, Make-Up, and Extra-Credit Policy:

Late HW and lab reports are accepted at a penalty of 50% and cannot be submitted after one week (One week has Monday through Sunday) form due date. Reports. Extra credit will be given to students as I see it fit within the class time frame.

Attendance Policy:

Students are expected to attend all classes as scheduled. Attendance is taken starting the first day of the semester. Teacher has the right to count student absent if he/she arrives late to class or leave class early.

Communicating with your instructor:

ALL electronic communication with the instructor must be through your COM email. Due to FERPA restrictions, faculty cannot share any information about performance in the class through other electronic means. (Faculty may add additional statement requiring monitoring and communication expectations via Blackboard or other LMS)

Class evaluation:

Class evaluation is part of the grading in my classes. I use the evaluation to improve on my teaching skills. Your feedback helps me become a better instructor. During the period of class evaluation, you will be marked half day present until the admission provide me with all names that evaluated my courses. The admission won't talk about the content of the evaluation. But will tell me if have completed the evaluation or not.

Student Learner Outcome

Present a consistent methodology for solving engineering problems.

A five-step process:

1. State the problem clearly.
2. Describe the input and output information.
3. Work a simple example by hand.
4. Develop an algorithm and convert it to MATLAB®.
5. Test the solution with a variety of data.

Describe the exceptional computational and visualization capabilities of MATLAB.

1. Student aids: Each chapter ends with a summary that reviews the topics covered and includes a list of key terms. A MATLAB summary lists the symbols, commands, and functions defined in the chapter. Hints are provided to help students avoid common errors.
2. Visualization: Students learn to generate plots in a variety of formats they can use to analyze, interpret, and evaluate data. This draws on a key advantage of MATLAB — to visualize information related to a problem.
3. Software engineering concepts: Through MATLAB, users can write portable code that can be transferred from one computer platform to another. The course also addresses software life cycle, maintenance, and prototypes.
4. MATLAB functions: The course covers a range of new MATLAB functions and options.

Illustrate the problem-solving process through a variety of engineering examples and applications.

1. Practical applications: Numerous problems promote simple, readable solutions to help develop and reinforce problem-solving skills. Each topic is presented in clear problem statements that draw on practical examples.
2. Discipline-specific focus: Each chapter is organized around a specific application from a range of engineering disciplines to demonstrate the MATLAB capabilities.
3. Engineering Grand Challenges: The course presents real-world engineering and scientific examples, including prediction of weather, climate, and global change, mapping of the human genome, and improvements in vehicle performance.
4. Problem sets with data sets: These problems relate to a variety of engineering applications and allow students to practice at different levels of difficulty.
5. Data imports and exports: The course includes updated discussions and examples of how to import and export data to other applications, such as Excel.

Explain the engineering analysis and design process. Recognize the importance of collecting, recording, plotting, and interpreting technical data for engineering analysis and design. The design process encompasses the following activities (all of which must be completed): 1. Define the problem to be solved. 2. Acquire and assemble pertinent data. 3. Identify solution constraints and criteria. 4. Develop alternative solutions. 4. Select a solution based on analysis of alternatives. 5. Communicate the results.

Analyze data collected during laboratory exercises designed to expose students to the different engineering disciplines. Put into practice methods for graphical presentation of scientific data and graphical analysis of plotted data. Develop the ability to graph data using uniform and nonuniform scales. Apply methods of selected points and least squares for determining the equation that gives the best-fit line to the given data. Determine the most appropriate family of curves (linear, power, or exponential) that gives the best fit to the given data.

As part of a team, design a simple engineering device, write a design report, and present the design. For any engineering accomplishment, successful team performance requires cooperation that can be realized only through an understanding of the functions of the technology team. The technology team is one part of a larger team that has the overall responsibility for bringing a device, process, or system into reality.

Demonstrate computer literacy. Certain problems suggest the use of a computer or spreadsheet for solution. These are open-ended or “what-if” problems. Depending on the students’ prior work with programming or spreadsheets, additional instruction may be required before attempting these problems.

The GCIC Academic Symposium:

COM’s GCIC Academic Symposium is an opportunity for students to showcase their best academic and creative projects. Because faculty know the value of this event, we are especially motivated to help you gain knowledge concerning it. Speak with me if you’d like to learn more and/or visit: <http://www.com.edu/symposium>. Participation in the symposium helps develop your professional skills, widens your professional networks, and should be noted on your resume. This year, the symposium is Friday, April 1, 2022. The abstract submission deadline is Friday, Feb. 25, 2022, at 11:59 pm. Please feel free to send to people who might also wish to include it...

Academic Dishonesty: Any incident in violation of academic policy will be dealt with in accordance with college policy and Student Handbook. Academic dishonesty (i.e., cheating on exams) is an extremely serious offense and will result in a **grade of zero** on that exam and the student may be referred to the Dean of Students for the appropriate discipline action.

Plagiarism: Plagiarism is using someone else’s words or ideas and claiming them as your own and is a very serious offense. Plagiarism includes paraphrasing someone else’s words without giving proper citation, copying directly from a website and pasting it into your paper, using someone else’s words without quotation marks. Any assignment containing plagiarized material will receive a **grade of zero** and the student may be referred to the Dean of Students for the appropriate discipline action. **Link(s) to resource(s) about avoiding plagiarism:** <https://owl.english.purdue.edu/owl/resource/589/01/>

Student Concerns: If you have any questions or concerns about any aspect of this course, please contact me using the contact information previously provided. If, after discussing your concern with me, you continue to have questions, please contact Chair of Department of Science and Engineering, Sheena Abernathy at (409)933-8330 or sabernathy@com.edu.

Classroom Conduct Policy:

College of the Mainland requires that students enrolled at COM be familiar with the Standards of Student Conduct, which can be found in the on-line Student Handbook. <http://www.com.edu/student-services/student-handbook.php>. Students should act in a professional manner at all times. Disruptive students will be held accountable according to college policy. Any

violations of the Code of Conduct will result in a referral to the Office for student Conduct and may result in dismissal from this class.

Behavioral Expectations Each student is entitled to an environment conducive to learning. Any situation that prevents students from learning or the instructor from teaching is considered to be a disruption. Please be respectful of your fellow students and the instructor by adhering to the following:

1. Cell phones can be used sparingly during class, but if the use begins to be a disruption to yourself, other students, or the instructor, you will be asked to put the device away. Certain devices can be used to view content on the internet; however, this is at the discretion of the instructor. Laptops are ONLY permitted during class to take notes. Surfing the internet or checking email from your laptop is not permitted. ***During exams, no electronics will be allowed out. Items not allowed include, but are not limited to, cell phones, laptops, tablets, ear buds, headphones. If the student has any of these devices out during an exam, the exam will be taken from the student, and they will receive a zero for that exam.***
2. Students can be removed from the class if they are exhibiting disruptive behavior as deemed by the instructor. Repeated incidents will result in automatic withdrawal from the class. Students who display this conduct will be removed from the class and a Conduct Referral Form may be submitted to the Dean of Students.

Success tips for Students:

Build Rapport If you find that you have any trouble keeping up with assignments or other aspects of the course, make sure you let your instructor know as early as possible. As you will find, building rapport and effective relationships are key to becoming an effective professional. Make sure that you are proactive in informing your instructor when difficulties arise during the semester so that they can help you find a solution.

10 Tips to Succeed in Class

1. **Come to class.** In some courses all you have to do is read the book; that's not the case here. The lecture will key you into what is important and what isn't; it will also provide a framework to stuff all the facts into. If you must miss class, get the notes from a fellow student or the web, and then go over the notes with someone who was present at the live lecture.
2. **Take notes.** Everything that really matters will be discussed in class; the book is really just for back up. The PowerPoints are posted online to help you fill in anything you missed. Taking notes helps you pay attention in class and remember the material.
3. **Form a study group or partnership.** Don't try to do it alone. Study groups are generally good because they help you go over the material, give you an opportunity to practice explaining your answers, and provide moral support.
4. **Do the problems.** Seriously and carefully. Do the problems at the back of each chapter
5. **Make diagrams,** pictures, summary charts, concept maps, etc. The ones in the book (and the ones handed out in class) may be good, but for best results, you should make your own.
6. **Keep up.** The current material is always based on what came before, so once you get behind it is very difficult to catch up. Some students find it is very helpful to quickly look over the notes of the previous lecture right before the current one.
7. **Read** one of the texts before class if the material is new to you. It is very hard to follow the lecture if every word and concept is unfamiliar.
8. **Ask questions.** If you don't understand something, ASK. The more effort you put into asking questions, the more you will get out of the answers.

9. **Master the vocabulary.** The stress in this course may be on *using* the vocabulary, but you won't get anywhere until you learn it first. So, try to master all new terms as fast as possible.

10. **A word or two about grades** In this course you have to know how to use the material, not just repeat it or explain it in your own words. If you think your performance on the exam does not reflect your knowledge, it often means you have memorized the facts but have not practiced enough at selecting the right ones and applying them to whatever problem is presented to you.

Course outline:

FALL 2021 TENTATIVE COURSE OUTLINE			
Week	DAY	Lecture/Lab Topic(s)	Due Dates for Course Assignment(s)
1	1/18	Chapter 1: An Introduction to Engineering Problem Solving	
	1/20	Chapter 1: An Introduction to Engineering Problem Solving	
2	1/25	Chapter 1: An Introduction to Engineering Problem Solving	HW1 is due on January 27, 2022
	1/27	Chapter 1: An Introduction to Engineering Problem Solving	
3	2/1	Chapter 2: Getting Started with MATLAB	
	2/3	Chapter 2: Getting Started with MATLAB	
4	2/8	Chapter 2: Getting Started with MATLAB	HW2 is due on February 10, 2022
	2/10	Chapter 2: Getting Started with MATLAB	
5	2/15	Chapter 3: MATLAB Functions	
	2/17	Chapter 3: MATLAB Functions	
6	2/22	Chapter 3: MATLAB Functions	HW3 is due on February 24, 2022
	2/24	Chapter 3: MATLAB Functions	
7	3/1	Midterm	Midterm is due March 3, 2022
		Chapter 4: Plotting	
	3/3	Midterm	
8	3/8	Chapter 4: Plotting	HW4 is due on March 10, 2022
	3/10	Chapter 4: Plotting	
9	3/22	Chapter 5: Control Structures	
	3/24	Chapter 5: Control Structures	
10	3/29	Chapter 5: Control Structures	HW5 is due on March 31, 2022

	3/31	Chapter 5: Control Structures	
11	4/5	Chapter 6: Matrix Computations	
	4/7	Chapter 6: Matrix Computations	
12	4/12	Chapter 6: Matrix Computations	HW6 is due on April 14, 2022
	4/14	Chapter 6: Matrix Computations	
13	4/19	Chapter 7: Numerical Techniques	
	4/21	Chapter 7: Numerical Techniques	
14	4/26	Chapter 7: Numerical Techniques	HW7 is due on April 28, 2022
	4/28	Chapter 7: Numerical Techniques	
15	5/3	Final Exam	Final Exam is due on May 5, 2022
	5/5	Final Exam	

Institutional Policies and Guidelines

Grade Appeal Process: Concerns about the accuracy of grades should first be discussed with the instructor. A request for a change of grade is a formal request and must be made within six months of the grade assignment. Directions for filing an appeal can be found in the student handbook. <https://build.com.edu/uploads/sitecontent/files/student-services/Student_Handbook_2019-2020v5.pdf. An appeal will not be considered because of general dissatisfaction with a grade, penalty, or outcome of a course. Disagreement with the instructor's professional judgment of the quality of the student's work and performance is also not an admissible basis for a grade appeal. https://build.com.edu/uploads/sitecontent/files/student-services/Student_Handbook_2019-2020v5.pdf

Academic Success & Support Services: College of the Mainland is committed to providing students the necessary support and tools for success in their college careers. Support is offered through our Tutoring Services, Library, Counseling, and through Student Services. Please discuss any concerns with your faculty or an advisor.

ADA Statement: Any student with a documented disability needing academic accommodations is requested to contact Holly Bankston at 409-933-8520 or hbankston@com.edu. The Office of Services for Students with Disabilities is located in the Student Success Center.

Counseling Statement: Any student needing counseling services is requested to please contact Holly Bankston in the student success center at 409-933-8520 or hbankston@com.edu. Counseling services are available on campus in the student center for free and students can also email counseling@com.edu to set up their appointment. Appointments are strongly encouraged; however, some concerns may be addressed on a walk-in basis.

Textbook Purchasing Statement: A student attending College of the Mainland is not under any obligation to purchase a textbook from the college-affiliated bookstore. The same textbook may also be available from an independent retailer, including an online retailer.

Withdrawal Policy: Students may withdraw from this course for any reason prior to the last eligible day for a “W” grade. Before withdrawing students should speak with the instructor and consult an advisor. Students are permitted to withdraw only six times during their college career by state law. The last date to withdraw from the 1st 8-week session is March 2. The last date to withdraw from the 16-week session is April 25. The last date to withdraw for the 2nd 8-week session is May 4.

FN Grading: The FN grade is issued in cases of failure due to a lack of attendance, as determined by the instructor. The FN grade may be issued for cases in which the student ceases or fails to attend class, submit assignments, or participate in required capacities, and for which the student has failed to withdraw. The issuing of the FN grade is at the discretion of the instructor. The last date of attendance should be documented for submission of an FN grade.

Early Alert Program: The Student Success Center at College of the Mainland has implemented an Early Alert Program because student success and retention are very important to us. I have been asked to refer students to the program throughout the semester if they are having difficulty completing assignments or have poor attendance. If you are referred to the Early Alert Program you will be contacted by someone in the Student Success Center who will schedule a meeting with you to see what assistance they can offer in order for you to meet your academic goals.

COVID-19 Statement: All students, faculty, and staff are expected to familiarize themselves with materials and information contained on the College of the Mainland’s Coronavirus Information site at www.com.edu/coronavirus. In compliance with Governor Abbott's May 18 Executive Order, face coverings/masks will no longer be required on COM campus. Protocols and college signage are being updated. We will no longer enforce any COM protocol that requires face coverings. We continue to encourage all members of the COM community to distance, when possible, use hygiene measures, and get vaccinated to protect against COVID-19. Please visit com.edu/coronavirus for future updates.

Course policies are subject to change, and it is the student’s responsibility to check Blackboard for corrections or updates to the syllabus.