



ENGR-2301-101CL
Programming for Engineers
Fall 2023
1:30 pm to 4:20 pm
Tuesday and Thursday

Instructor Information:

Instructor: Dr. Rebecca Fagan

E-mail: rfagan@com.edu (preferred method of communication)

Office: (409)933-8244

Student hours and location:

Tuesday, Wednesday, and Friday 9:30am to 12:00pm

Or by appointment

Location: STEAM 325-18

Required Textbook/Materials:

Textbook

- Engineering Computation: An Introduction Using MATLAB and Excel
Joseph Musto and William Howard and Richard Williams
McGraw Hill; 2nd edition (2021) ISBN10: 007338027X

Materials

- Engineer Pad, 5 Squares per Inch, 8.5" x 11", Green

Online Resources

- COM BrightSpace: <https://de.com.edu/webapps/login/>
Training is required to access. If you have any questions regarding course access or training, please contact the Distance Education department at ext. 8476.

Course Description:

- (LECTURE 2, LAB 4). CREDIT 3. ACGM
- 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

Course requirements:**Calculators**

- <https://nces.org/exams/calculator/>
- NCEES approved calculators will be used for exams. After your first warning, your exam will be collected and your grade will be a zero if you are caught using a non-approved calculator.
 - Casio: All fx-115 and fx-991 models
(Any Casio calculator must have “fx-115” or “fx-991” in its model name.)
 - Hewlett Packard: The HP 33s and HP 35s models, but no others
 - Texas Instruments: All TI-30X and TI-36X models
(Any Texas Instruments calculator must have “TI-30X” or “TI-36X” in its model name.)

Lectures

- Each class will cover textbook material.

Homework Assignments

- These assignments will be linked to the course material to help reinforce the information covered in lecture.
- Homework has deadlines and must be completed on time for full credit.

Projects

- These will be design projects inclusive of a full formal report.

Determination of Course Grade/Detailed Grading Formula:

The details of how each item will be added to your final total are shown in the following chart.

Task	Total	% of the FINAL grade
Attendance (10 points each)	300	15%
Tutorials (20 points each)	740	37%
Homework (20 points each)	560	28%
Projects (200 points each)	400	20%
Total	2000	100%

Percentage	Letter Grade
90 – 100%	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
0 – 59%	F

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

Any deviations from the policies described below are at the sole discretion of the instructor.

Late Work

- Late work will be accepted ONE WEEK late ONLY and given **HALF CREDIT**.
 - Tutorials
 - Homework

Make-Up**Exams**

- There are no exams.

Attendance Policy:

COM recognizes no excused absences other than those prescribed by law: religious holy days and military service <https://www.com.edu/student-services/student-handbook.html>.

- Students are expected to attend all class sessions as listed on the course calendar.
- Attendance will be taken at the beginning of each class.
- Leaving early from class (without approval from the instructor) may result in an absence for that day.
- IF you do have to miss class, it is your responsibility to obtain notes from a classmate.
- Missing lectures may affect your all over class performance.
- Should you anticipate an absence, you must contact your instructor by email PRIOR to the absence.
- Each situation will be evaluated independently.
- You must provide legitimate proof for your absence.

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.

Student Learner Outcomes:

Upon successful completion of this course, students will successfully demonstrate mastery of the Student Learner Outcomes listed below.

Student Learner Outcomes*	Core Objectives**	Assessed via this Assignment
1. Use matrix and array operations for equation solving.	Teamwork	In Class Tutorials
2. Identify the strengths and weaknesses of the conventional programming languages.	Critical Thinking Skills	Project
3. Use spreadsheets and their built-in features to solve a variety of engineering problems,	Personal Responsibility	In Class Tutorials

Student Learner Outcomes*	Core Objectives**	Assessed via this Assignment
4. Describe methods for the design of programs that control equipment or analyze data.	Communication Skills	Project
5. Write computer programs to solve engineering problems and perform engineering simulations	Empirical and Quantitative Skills	Write computer programs to solve
6. Graphically present engineering data, results, and conclusions.	Social Responsibility	Graphically present

** <https://reportcenter.highered.texas.gov/training-materials/lower-division-academic-course-guide-spring-21/>

** <http://leaptx.org/coreobjectives/>

Academic Dishonesty:

- College of the Mainland is committed to a high standard of academic integrity. In becoming a part of the academic community, students are responsible for honesty and independent effort. Incidents of academic and scholastic dishonesty (including cheating, plagiarism, and collusion) will be dealt with in a manner consistent with College Policy and the Student Handbook.
- Violations may result in a penalty. The maximum penalty will be a grade of "F" for the course. Violations may also be reported to the Judicial Coordinator as instances of Inappropriate Behavior. Please see the section on Privileges and Obligations in the Student Handbook for a more complete discussion of Inappropriate Behavior, and of your rights and responsibilities.
- There are many situations where you will be required to submit written work to earn points. It is important that the work you submit be your own. You cannot copy the work of another, or have your work copied by another. Doing so will be considered a violation of Academic Honesty.
- The work that you submit must be a product of your own mind. When completing assignments, for example, you are encouraged to collaborate with others to try to come to an understanding. But when you set pen to paper to write your answer, what you write must be a product of your own mind. When identical, or nearly identical, writings are submitted by students, it will lead me to suspect that work was copied. You could then be in violation of the standards of academic honesty, as described above.

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 the department chairperson, Professor Sheena Abernathy, either in person, by telephone at 409-933-8330, or by email at sabernathy@com.edu.

Course outline:***ENGR-2304-101CL, Programming for Engineers – Tentative Course Schedule***

Class	Date	Lecture Topic	Homework Due
1	Tuesday, August 29	Lecture: Computing Tools	—
2	Thursday, August 31	Lecture: The Excel Interface Tutorial: Entering and Formatting Data With Excel Tutorial: Entering and Formatting Formulas With Excel Tutorial: Using Built-in Functions	#01
3	Tuesday, September 5	Tutorial: Performing Logical Tests Using the IF Statement Tutorial: Using Lookup Tables Tutorial: Interpolating With Excel	#02
4	Thursday, September 7	Lecture: The MATLAB Interface Tutorial: Using the Command Window for Interactive Computation Tutorial: Using MATLAB Script Files Tutorial: Using MATLAB Function Files	#03
5	Tuesday, September 12	Tutorial: Computing With One-Dimensional Arrays Tutorial: Computing With Two-Dimensional Arrays Tutorial: Saving a MATLAB Session	#04
6	Thursday, September 14	Tutorial: Computing With One-Dimensional Arrays Tutorial: Computing With Two-Dimensional Arrays Tutorial: Saving a MATLAB Session	#05
7	Tuesday, September 19	Lecture: Flowcharts Tutorial: Loop Commands Tutorial: Logical Branching Statements	#06
8	Thursday, September 21	Tutorial: Combining Loops and Logic	#07
9	Tuesday, September 26	Tutorial: Formatting MATLAB Output	#08
10	Thursday, September 28	Lecture: Types of Graphs Lecture: XY Graphs Lecture: Guidelines for Producing Good Graphs 5.2.1 - Tutorial: Plotting in Equations in Excel	#09
11	Tuesday, October 3	5.2.3 - Tutorial: Plotting Data and Curve Fitting with Excel 5.4 - Tutorial: Creating Other Types of Graphs With Excel	#10
12	Thursday, October 5	5.2.2 - Tutorial: Plotting in Equations in MATLAB 5.2.4 - Tutorial: Plotting Data and Curve Fitting with MATLAB	#11
13	Tuesday, October 10	Project Presentations	#12

Class	Date	Lecture Topic	Homework Due
14	Thursday, October 12	Lecture: Motivation Lecture: Roots of Equations: Theory Tutorial: Solution of General Nonlinear Equations Using MATLAB	#13
15	Tuesday, October 17	Tutorial: Solution of Polynomial Equations Using MATLAB	#14
16	Thursday, October 19	Tutorial: Solution of General Nonlinear Equations Using Excel	#15
17	Tuesday, October 24	Lecture: Properties of Matrices Tutorial: Matrix Operations Using Excel	#16
18	Thursday, October 26	Tutorial: Matrix Operations Using MATLAB	#17
19	Tuesday, October 31	Lecture: Systems of Linear Equations Tutorial: Solutions of Linear Equations Using Excel	#18
20	Thursday, November 2	Tutorial: Solving Nonlinear Simultaneous Equations Using Excel Deadline to submit Fall 2022 Graduation	#19
21	Tuesday, November 7	Tutorial: Solutions to Simultaneous Linear Equations Using MATLAB	#20
22	Thursday, November 9	Tutorial: Solving Nonlinear Simultaneous Equations Using MATLAB	#21
23	Tuesday, November 14	Lecture: Concepts From Calculus Tutorial: Numerical Integration of Functions	#22
24	Thursday, November 16	Tutorial: Numerical Integration of Measured Data	#23
25	Tuesday, November 21	Lecture: Wind Loads on a Low Rise Building for Project Lecture: Engineering Optimization	#24
—	Thursday, November 23	THANKSGIVING	—
26	Tuesday, November 28	Lecture: Formulating an Optimization Problem Lecture: Solution of an Optimization Problem	#25
27	Thursday, November 30	Lecture: Solution of an Optimization Problem Tutorial: Solution of an Optimization Problem Using MATLAB, fminsearch and fminband	#26
28	Tuesday, December 5	Tutorial: Solution of an Optimization Problem Using Excel, constrained and unconstrained	#27
29	Thursday, December 7	Tutorial: Engineering Application of Linear Constrained Optimization	#28
30	Tuesday, December 12	Project Presentations	—

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://www.com.edu/student-services/docs/Student_Handbook_2023-2024_v2.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.*

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 Kimberly Lachney at 409-933-8919 or klachney@com.edu. The Office of Services for Students with Disabilities is located in the Student Success Center.

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 October 11. The last date to withdraw from the 16-week session is November 28. The last date to withdraw for the 2nd 8-week session is December 7.

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.

Resources to Help with Stress:

If you are experiencing stress or anxiety about your daily living needs including food, housing or just feel you could benefit from free resources to help you through a difficult time, please click here <https://www.com.edu/community-resource-center/>. College of the Mainland has partnered with free community resources to help you stay on track with your schoolwork, by addressing life issues that get in the way of doing your best in school. All services are private and confidential. You may also contact the Dean of Students office at deanofstudents@com.edu or communityresources@com.edu.