MENG/EENG 2212: ENGINEERING COMPUTATION

COURSE INSTRUCTOR
Dr. Zeki Ilhan (zeki.ilhan@msutexas.edu)
Office: McCoy Hall 219E
Phone: (940) 397-4004

TEACHING ASSISTANT
TBA

CLASS SCHEDULE

Days	Time	Location
Monday		
Tuesday		
Wednesday		
Thursday	02:00 pm – 03:50 pm	MY 207
Friday		

OFFICE HOURS

Days	Time	Location
Monday	01:00 pm – 03:00 pm	MY 219E
Tuesday	11:00 am – 12:00 pm	MY 219E
Wednesday		
Thursday	11:00 am – 12:00 pm	MY 219E
Friday	11:00 am – 12:00 pm	MY 219E

CATALOG DESCRIPTION
This course is an introduction to the use of MATLAB© and Excel©. Two parts are included in this course. The two parts are the Computational Tools and Engineering Applications. This course provides a detailed introduction to the computational techniques, numerical methods, and computational tools used by engineering students. This course includes study of the fundamental of numerical computations and analyses through the use of MATLAB© and Excel©. MATLAB© can be used for math computations, modeling and simulations, data analysis and processing, visualization and graphics, and algorithm development. Excel© can be used for related calculations, graphing tools, axis tables, and programming language.

REQUIRED TEXTBOOK
Engineering Computation: An Introduction Using MATLAB and Excel
by Musto, Howard & Williams (2nd Edition)
McGraw Hill. (ISBN-13: 978-1260588750)

LIST OF TOPICS COVERED*
- Matrix Mathematics
- Using MATLAB© Command Window
- Writing MATLAB© Functions & Scripts
- Programming with Loops & Logic
- Programming with Combined Loops & Logic
- Plotting & Formatting Data in MATLAB©
- Finding Roots of Equations in MATLAB©
- Solving Simultaneous Equations in MATLAB©
- Solving Optimization Problems in MATLAB©
- Solving Optimization Problems in Excel©

*Additional material might be covered as the time permits.

ATTENDANCE POLICY
This course will be delivered in face-to-face mode. Attendance is mandatory, and it represents a part of your overall grade. Attendance will be checked randomly ***on select lectures*** using the AttendMe App. Detailed instructions on how to download and use the app will be made available in the lectures.

GRADING SCHEME

The overall grade will be based on the scores earned on the tests, homework assignments, and attendance. Three exams sum up to 80% of the total grade, homework scores sum up to an additional 15%, and the remaining 5% is the attendance. The contribution of each grade item to the overall score is provided in Table 1.

Table 1: Percentage contribution of each grade item to the overall grade.

Grade Item	Contribution
Test 1	25%
Test 2	25%
Final Exam	30%
Homework	15%
Attendance	5%
TOTAL	**100%**

FINAL EXAM

Thursday, December 11, 01:00 pm – 03:00 pm

DESIRE 2 LEARN (D2L) & BRIGHTSPACE PULSE

I will use the D2L platform for posting the syllabus, course communication, lecture notes, assignments, and grades. Mobile version of the D2L platform is the Brightspace Pulse App, which is available for free on iPhone, iPad, and Android devices. Consider downloading Pulse for instant notifications about the course.

STUDENT RESOURCES

For quick links to numerous offices and student services available on the MSU Campus, please refer to the MCOSME Student Resources Website

ACADEMIC MISCONDUCT POLICY & PROCEDURES

Academic Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work, not the individual to whom credit is given). Additional guidelines on procedures in these matters may be found in the Office of Student Conduct.

USE OF GENERATIVE AI

Students may use AI tools (e.g., ChatGPT) for brainstorming purposes, similar to how one might use a search engine like Google. However, generating assignments ***entirely*** through AI without meaningful personal input, revision, or understanding is ***not*** permitted and will be considered a form of plagiarism.

CONFLICT RESOLUTION PROCESS

1. In the event of an issue with the course or the instructor, the student should first contact the instructor. The faculty and the student will discuss the issue. Hopefully, a resolution is reached.

2. The student should notify the faculty via email again if the issue still did not get resolved after the first communication.

3. If not resolved, the student could then contact the Chair of the McCoy School of Engineering, Dr. Desai, face to face or via email, (raj.desai@msutexas.edu), and discuss the issue.

4. Dr. Desai will discuss the issue at hand with the faculty member. Dr. Desai will discuss the result of this discussion with the student. Hopefully, a resolution is reached on the issue after this step.

5. The student should notify the Chair via email if the issue still did not get resolved.

6. The Chair will contact the Dean and try to resolve the conflict. In case the conflict deals with the student grade, he will forward the case to the Grade Appeals Committee, if necessary.

COURSE ORGANIZATION AND ASSESMENT

- **Course Format:** This course consists of one 110-minute session each week. Class meetings will cover the most essential lecture topics and some example problems. Due to time limitations, not all the material in the textbook can be covered during the class; hence, follow the instructor's guidance and the lecture notes in D2L to relate the lecture material to the relevant chapters/sections of the textbook. You will ***not*** be responsible for those chapters/sections of the textbook that are not covered in the class.

- **General Study Guidelines:** Plan on spending few hours outside of class *each week* to carefully review the lecture material discussed during the week. It is better to ***go through the in-class exercises again, before working on the homework assignments.*** Do not wait until the last day to prepare for exams. Utilize office hours throughout the semester whenever you need help about the assignments or the course material.

- **Student Attitude:** After the class starts, the use of phones, conducting private discussions, working on anything that is not directly related to the course, and making derogatory remarks about your classmates or instructor will not be accepted and may result in your dismissal from the class.

- **Midterm Progress Reports:** In order to help students keep track of their progress toward course objectives, the instructor will provide a Midterm Progress Report for at-risk students through their WebWorld account. Midterm grades will not be reported on the students' transcript; nor will they be calculated in the cumulative GPA. They simply give students an idea of where they stand at the midpoint of the semester. Students with a midterm grade below a C should talk to the professor and seek out tutoring.

- **Homework Evaluation Method:** Your performance will be tested regularly throughout the semester by homework assignments. While several homework problems may be assigned as part of a homework assignment, it may be the case that only a subset of problems will be graded. However, you must attempt all problems. ***Do not try to guess which problems will not be graded.***

- **Late Assignments:** Homework assignments must be submitted on the due date, at the due time. Late assignments will *NOT* be accepted. However, depending on the overall class progress, ***one (or two) of the lowest graded assignments may not be included in the final grade.***

- **Exam Make-up:** Make-up exams will be given only in case of an ***emergency*** (accompanied by a doctor's report) or a well-documented conflict due to a scheduled ***athletic event*** or a ***conference.***

- **Grade Appeals:** Grade appeals should be resolved with the instructor. If unresolved, they need a formal written appeal to the Dean of the College in which the course was taught. For more information about the grade appeals, consult the Grade Appeal Checklist through the MCOSME Student Resources website.

- **Academic Honesty Appeals:** Academic honesty appeals are reported to the Department Chair. For more information about the academic honesty appeals, consult the Academic Honesty Checklist through the MCOSME Student Resources website.

- **Disability Support Services:** In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. If you have a documented disability that will impact your work in this class, please make an appointment through Disability Support Services located in the Clark Student Center, Room 168, (940) 397-4140.

- **Disclaimer Statement:** Information contained in this syllabus, other than grading policies, may be subject to change with advance notice, as deemed appropriate by the instructor.

COURSE OBEJCTIVES IN RELATIONSHIP TO ABET STUDENT OUTCOMES

Table 2: Course objectives matched with the ABET student outcomes (1-7)

COURSE OBJECTIVES	1	2	3	4	5	6	7
Students will be able to perform various matrix and vector operations in MATLAB©.	X					X	
Students will be able to perform calculations using the Command Window, Script Files, and Function Files in MATLAB©.	X					X	
Students will perform basic programming in MATLAB© by combining simple and nested loops with logical branching.	X					X	
Students will be able to generate simple, combined, and sub-plots, and format data using MATLAB©.	X					X	
Students will be able to find the roots of polynomials, and single linear and nonlinear equations using MATLAB©.	X					X	
Students will be able to find the roots of systems of linear and nonlinear equations using MATLAB©.	X					X	
Students will be able to solve constrained and unconstrained optimization problems using MATLAB© and Excel©.	X					X	

Table 3: Detailed descriptions of the ABET student outcomes (1-7) listed in Table 2.

ABET OUTCOME	DESCRIPTION
1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2	an ability to apply engineering design to produce solutions that meets specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3	an ability to communicate effectively with a range of audiences.
4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.