



MENG/EENG 2212: ENGINEERING COMPUTATION

COURSE INSTRUCTOR

Dr. Mohammad Nasfikur Rahman Khan (mohammad.khan@msutexas.edu)

Associate Professor, McCoy College of Science, Mathematics & Engineering

Office: Martin Hall, Room 113

Phone: (940) 397 4589

Class Schedule

Days	Time	Location
Monday	—	—
Tuesday	—	—
Wednesday	—	—
Thursday	2:00 pm – 3:50 pm	McCoy 207
Friday	—	—

Office Hours

Days	Time	Location
Monday	8:00 – 11:00 am	Martin 113
Tuesday	10:00 – 11:00 am	Martin 113
Wednesday	8:00–11:00 am, 3:00–5:00 pm	Martin 113
Thursday	10:00 – 11:00 am	Martin 113
Friday	By appointment	Martin 113

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.

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%

Letter Grade Scale

Table 2: The final numerical course average is converted to a letter grade as follows.

Letter Grade	Numerical Average	GPA Points	Description
A	90 – 100	4.0	Excellent
B	80 – 89.9	3.0	Good
C	70 – 79.9	2.0	Satisfactory
D	60 – 69.9	1.0	Poor
F	Below 60	0.0	Failing

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 ASSESSMENT

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 a 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 OBJECTIVES IN RELATIONSHIP TO ABET STUDENT OUTCOMES

Table 3: Course objectives matched with the ABET student outcomes (1–7).

Course Objective	Student Outcomes						
	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 4: Detailed descriptions of the ABET student outcomes (1–7) listed in Table 3.

ABET Outcome - Description	
1	An ability to identify, formulate, and solve complex engineering problems by applying the principles of engineering, science, and mathematics.
2	An ability to apply engineering design to produce solutions that meet 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 judgments, considering 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.