

SYLLABUS

Code/Name	MCE 110 / Introduction to Scientific Programming
Type	Required
Credit/ECTS	3/5
Hour per Week	4 (2+2+0)
Level/Year	Undergraduate/1
Semester	Spring
Classroom	L208
Content	Numbering systems. Basic computer hardware. Programming with C, C++ or another appropriate programming language. Logic statements, constants, variables, expressions, loops, arrays, selective structures, functions and recursive programming. Pointers and computer interfacing.
Prerequisites	NA
Textbooks	<i>Primary</i> WJ Palm, MATLAB for Engineering Applications, 5th edition, Mc Graw Hill, 2023. <i>Supplementary</i> SC Chapra, Applied Numerical Methods with MATLAB, 5th edition, Mc Graw Hill, 2023.
Objectives	<ul style="list-style-type: none"> • To learn the MATLAB interface and built-in functions • Make engineering applications including linear algebra and matrix operations • To develop fundamental programs with loops • Make engineering applications including numerical methods and computational error
Course Outcomes	In this course you will be able to: CO1 Use a programming software effectively CO2 Organize data plotting and some basic matrix operations in MATLAB software CO3 Organize built-in functions and arrays in MATLAB software CO4 Understand the use of loops in programming

Weekly Schedule of Topics

W	Topic
1	Introduction to MATLAB: An overview and built-in functions, arrays and plots
2	Problem solving methodologies, matrix operations
3	Elementary mathematical functions, user-defined functions
4	Programming with MATLAB; program design and development
5	Logical operators and functions, conditional statements
6	For and while loops
7	MATLAB applications: Review and additional problem statements and solutions
8	Advanced plotting, xy plotting functions
9	Two and three-dimensional plots
10	Statistics, probability and interpolation
11	Linear algebraic equations, matrix methods for linear equations
12	Matrix methods for linear equations, left-division method
13	Numerical methods for Calculus and differential equations
14	Special methods for linear equations

Professional Contribution	Understand the place and importance of computer software and programming in mechanical engineering
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Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	5	5	5	5	4	3	3	2	2	4	4
CO2	5	5	5	5	4	3	3	2	2	4	4
CO3	5	5	5	5	4	3	3	2	2	4	4
CO4	5	5	5	5	4	3	3	2	2	4	4
CO5	5	5	5	5	4	3	3	2	2	4	4

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Special Conditions

Requirements

Evaluation	Midterm Exam	30%
	Quiz	30%
	Final Exam	40%
	Total	100%

Rubric

- Course Policy**
1. You must attend at least 80% of the sessions including add-drop period
 2. Be in the class on time. Late attendance may result in grade deductions.
 3. English should always be used to communicate with one another.
 4. Mobile phone should be switched off and put away during the class.

- Cheating & Plagiarism**
- Copying or letting someone to copy your work on exams, assignments, or reports is cheating.
 - Cutting and pasting text, figures and tables from the web sources or any other electronic source is plagiarism.
 - A consequence of academic dishonesty is to receive a grade of FF for the course.

Instructor

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