

Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
 Mechanical Engineering Department
 2023-2024 Spring Semester
SYLLABUS

Code/Name	SEC 202.2 / Mathematical Tools for Mechanical Engineers
Type	Required
Credit/ECTS	4/4
Hour per Week	4 (2+2+0)
Level/Year	Undergraduate/2
Semester	Spring
Classroom	L308
Content	Introduction to an engineering math software (MATLAB) with a range of applications including fundamentals of vector analysis, vector algebra, integrals (line, surface and volume integrals), Gauss theorems, matrices, determinant, systems of linear equations, characteristic values and characteristic vectors of matrices, and complex numbers.
Prerequisites	
Textbooks	<p>Primary WJ Palm, <i>MATLAB for Engineering Applications</i>, 5th edition, Mc Graw Hill, 2023.</p> <p>Supplementary SC Chapra, <i>Applied Numerical Methods with MATLAB</i>, 5th edition, Mc Graw Hill, 2023.</p>
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	Programming with MATLAB; logical operators and functions, conditional statements
6	Programming with MATLAB; for and while loops
7	MATLAB applications: Review and additional problem statements and solutions
8	Advanced plotting, xy plotting functions
9	Advanced plotting, xy plotting functions, two and three-dimensional plots
10	Statistics, probability and interpolation
11	Linear algebraic equations, matrix methods for linear equations
12	Linear algebraic equations, 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	4	5	5	3	2	2	4	3	5	4
CO2	5	4	5	5	3	2	2	4	3	5	4
CO3	5	4	5	5	3	2	2	4	3	5	4
CO4	5	4	5	5	3	2	2	4	3	5	4

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

Special Conditions • The consequence of violation of the attendance rule is to receive a grade of DZ.

Requirements

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

Rubric

Course Policy	<ol style="list-style-type: none">1. You must attend at least 80% of the sessions including add-drop period.2. Be in the class on time.3. English should always be used to communicate with one another.4. Mobile phone should be switched off and put away during the class.
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Cheating & Plagiarism	<ul style="list-style-type: none">• 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.
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Instructor

Name/Surname	Alparslan Topcu	Email	alparslan.topcu@alanya.edu.tr
Office	D-002	Office Hours	Monday : 13:30 – 14:30 Thursday : 13:30 – 14:30

Prepared by Alparslan Topcu on February 04, 2024