

MAE 8
Matlab Programming for Engineering Analysis (4 units)

Class/Laboratory Schedule: three hours of lecture, one hour of lab, eight hours outside preparation. 12 hours/week total

Course Coordinator(s): Hieu Tan Pham, Marko Lubarda

Textbooks/Materials:

1. Stormy Attaway, *Matlab - A Practical Introduction to Programming and Problem Solving (4th edition)*, BH, 2017

Catalog Description: Computer programming in Matlab with elementary numerical analysis of engineering problems. Arithmetic and logical operations, arrays, graphical presentation of computations, symbolic mathematics, solutions of equations, and introduction to data structures.

Prerequisites: Math 20A and Math 20B or consent of instructor

Course type: Required

Performance Criteria:

Objective 1

Students successfully develop programs by using Matlab environment

Objective 2

Students develop programs in homework and quizzes to compute inner products of one-dimensional arrays and multiplication of matrices stored in two-dimensional arrays

Objective 3

Students develop programs with vectorized codes and various functions

Objective 4

Students process various input data files, analyze them, make output files and advance plots

Objective 5

Students locate available resources on engineering ethics by using Google

Course Objective:

(Number in parentheses refer to the specific MAE Program Outcomes)

1. To teach students basic programming skills under the Matlab environment (1, 2, 6, ME8, ME9)
2. To teach students to compute inner array product and matrix multiplication (1, 2, 6, ME8, ME9)
3. To teach students vectorized programming skills (1, 2, 6, ME8, ME9)
4. To teach students processing data files and make advanced 2D and 3D plots (1, 2, 6, ME8, ME9, ME10)
5. To teach students locating resources on engineering ethics (1)

Course Topics:

1. Introduction to Matlab software
2. Vectors & Matrices
3. Introduction to Matlab Programming
4. Selection Statements
5. Loop Statements and Vectorizing Code
6. Matlab Programs
7. String Manipulation, Data Structures
8. Advanced File Input and Output
9. Advanced Functions

Last Updated: 8th July 2019