1. *Course number and name*

**ENGR 271: Introduction to MATLAB**

1. *Credits and contact hours*

1 credit hour

1. *Instructor’s or course coordinator’s name*

Instructor: Amir Pourmousa

Course coordinator: Mojtaba Azadi, Associate Professor

1. *Textbook, title, author, and year*

Andre Knoesen and Rajeevan Amirtharajah, Introduction to MATLAB with Zylabs, 1st Edition, Zybooks, 2023.

MATLAB zyBook interactive textbook: <https://www.zybooks.com/>

1. *other supplemental materials*

William J. Palm III, MATLAB for Engineering Applications, 4th Edition, McGraw-Hill Education, 2018.

1. *Specific course information*
   1. *brief description of the content of the course (catalog description)*

Basic introduction to MATLAB language: array manipulations; control-flow; script and function files; simple 2-D plotting and editing; Simulink; graphical user interface.

* 1. *prerequisites or co-requisites*

Sophomore standing or later; Math 226 or equivalent with a grade C or better

* 1. *indicate whether a required, elective, or selected elective course in the program*

Elective for Mechanical Engineering and Electrical Engineering

1. *Specific goals for the course*
   1. *Specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*
      * Students will be introduced to the basic operations of the MATLAB language.
      * Students will write simple script files and function files in MATLAB.
      * Students will learn the effective use of the built-in features of 2-D plotting.
      * Students will learn to create user-defined functions to perform mathematical operations and engineering analysis
      * Students will learn the use of the built-in features of Simulink and block systems.
   2. *Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

Course addresses ABET Student Outcome(s): 1,2,6

1. *Brief list of topics to be covered*

* Basic operations of MATLAB.
* MATLAB environment, variables, and data types.
* MATLAB scripts and functions.
* Matrix computations.
* Programming with MATLAB using repetition statements, conditional statements, and logical operators
* File input/output (text files, csv, excel, image)
* Data processing and manipulation of data for analysis
* Advanced Plotting Techniques
* Symbolic mathematics.
* Numerical techniques and numerical errors.
* Solving Ordinary Differential Equations (ODEs)
* App Designer (GUI)
* Simulink