The University of Texas at Tyler
Department of Electrical Engineering

EENG 3308.060: Programming Languages for Design

Syllabus

Catalog Description:

EENG 3308: Programming Languages for Design
A hands-on course designed to teach students programming languages and tools for design projects. Introduction to high-level programming languages and modern engineering tools for systems modeling, analysis and design: Matlab; Python; NI Labview; basic project implementation using a microcontroller development environment. Three hours of lecture per week.

Prerequisites: N/A

Credits: 3 (3 hours lecture, 0 hours laboratory per week)

Text(s): No Textbook

Required Material :

Text: Documentation and reference materials provided by the Instructor.
Software: MATLAB 2013 or later, Python 3 compiler, NI LabVIEW, Arduino IDE.
Hardware: A list of sensors, microcontrollers, and components to build a small robotic and IoT project must be purchased for the group project. Here is an example: https://www.amazon.com/VKmaker-Avoidance-tracking-Ultrasonic-tutorial/dp/B01CXVA6IO

Course Coordinator: Dr. Fatemeh Kalantari, Assistant Professor

Topics Covered: (paragraph of topics separated by semicolons)

MATLAB: Variables and functions, Basic Arithmetic Operations, Conditional statements, loops, Data Imports and Analysis; **Python 3:** Object and Data Structure Basics, Comparison Operators and Statements, Methods and Functions, Object Oriented Programming, Modules and Packages, Error and Exceptions Handling; **LabView:** Types of data, structures & Loops, Array, Numeric, String, Timing Project, File & Report; **Arduino:** Programming Basics, User Input, Feedback, Sensors, Robotics, The Internet of Things (IoT).

Evaluation Methods: (only items in dark print apply):

1. Examinations/ Quizzes
2. Homework
3. Report
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course Learning Outcomes[1]: By the end of this course students will be able to:

1. Use MATLAB functions to perform mathematical operations and plotting with scalars, complex numbers, matrices and vectors. [1,4]
2. Implement algorithms such as solving sets of simultaneous equations and numerical methods using basic structured programs in MATLAB. [1,4]
3. Import and Export data using MATLAB programming. [4,5]
4. Understand Python object-oriented and functional programming styles in a development environment [1]
5. Apply key Python data structures and algorithms effectively for scientific computing [1,4]
6. Analyze the user input and feedback system in Arduino programming. [1]
7. Implement basic project in the Arduino microcontroller integrated development environment. [5]
8. Analyze the significance of the given programming languages in current market. [3,6]
9. Explore the applications of Arduino in IoT and robotics. [5]

[1] *Numbers in brackets refer to method(s) used to evaluate the course learning outcome.*

Relationship to Student Outcomes (only items in dark print apply)[2]: This course supports the following Electrical Engineering Student Outcomes, which state that our students will possess:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics [1,2]
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 [4, 6].
3. an ability to communicate effectively with a range of audiences [8]
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts [9]
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 [5]
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions [3]
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. [7]

[2]*Numbers in brackets refer to course learning outcome(s) that address the Program Outcome.*

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:		hours
Engineering Sciences and Design:	3	hours
General Education Component:		hours

Grade Replacement:

If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12th day of class. Failure to file an intent to use grade forgiveness will result in both the original and repeated grade being used to calculate your overall grade point average. A student will receive grade forgiveness (grade replacement) for only three (undergraduate student) or two (graduate student) course repeats during his/her career at UT Tyler. (2006-08 Catalog, p. 35)

Prepared By:	Prabha Sundaravadivel, Assistant Professor	Date:	3 January 2022
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	Fatemeh Kalantari, Assistant Professor		12 December 2025