Computer Programming for Engineers: MATLAB

COP 2271   Section EE03
Class Periods: Friday, 2-3rd period, 8:30-10:25 am
Location: NEB 101
COP 2271   Section EE06
Class Periods: Friday, 4-5th period, 10:40 am-12:35 pm
Location: MAEB 211
COP 2271   Section EE08
Class Periods: Wednesday, 8-9th period, 3:00-4:55 pm
Location: BAR 211
Academic Term: Spring 2020

Instructor:
Kwansun Cho
ckstone@ufl.edu
(352) 294-6883
Office Hours: Wednesday, 11:45 am – 1:40 pm, Nuclear Sciences Building (NSC) 202C

Peer Mentor:
Please contact through the Canvas website
- William Kao, williamkao@ufl.edu, office location (TBA), office hours (TBA)
- Kimberly Gmuer, gmuer.kmarie@ufl.edu, office location (TBA), office hours (TBA)
- Mahmoud Fakhouri, Mahmoud.fakhouri@ufl.edu, office location (TBA), office hours (TBA)

Course Description
Computer programming and the use of computers to solve engineering and mathematical problems. Emphasizes applying problem solving skills; directed toward technical careers in fields employing a reasonably high degree of mathematics. The programming language used depends on the demands of the departments in the college. Several languages may be taught each semester, no more than one per section. Those required to learn a specific language must enroll in the correct section.

Course Pre-Requisites / Co-Requisites
(Prereq) MAC 2312 - Analytic Geometry and Calculus 2 with a minimum grade of C

Course Objectives
The main objective of this course is to provide a foundation in programming for engineering problem solving using the MATLAB software package. Students will develop the skills to analyze and break down an engineering program and solve it algorithmically using MATLAB. After this course, students will have an understanding of various programming constructs and how they can be used to solve a computational problem.

Materials and Supply Fees
Not applicable

Professional Component (ABET):
This course uses several programming assignments that teach students how to effectively develop programming solutions to engineering problems. Students will develop the skills to analyze a given engineering/mathematical question and pose it is a software solution.

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	High

2.	An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	High
3.	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	
4.	An ability to communicate effectively with a range of audiences	Low
5.	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.	Medium
6.	An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.	High
7.	An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Required Textbooks and Software
An official textbook is not required but recommended. We will use the Canvas course site EXTENSIVELY to post course material. It will be every student's responsibility to be familiar with the material posted on the course web site. Homework assignments and in-class activities may be completed using any recent version of MATLAB. The MATLAB software is available for free through UF Apps (https://info.apps.ufl.edu/) and in certain computer labs. If students prefer to actually own the MATLAB software, they can purchase a student version directly from Mathworks (https://www.mathworks.com/products/matlab/student.html).

Recommended Material
- Title: MATLAB: A Practical Introduction to Programming and Problem Solving
- Author: Stormy Attaway
- Publication date and edition: August 6, 2016, 4th Edition
- ISBN-13: 978-0128045251

Course Schedule
Week 01 (01/06 – 01/10):   Introduction to Information, Technology and Computers
Week 02 (01/13 – 01/17):   MATLAB interface, user input and output, variables, operators
Week 03 (01/20 – 01/24):   Selection – if statements
Week 04 (01/27 – 01/31):   Repetition – while loops, break, continue
Week 05 (02/03 – 02/07):   Repetition – for loops
Week 06 (02/10 – 02/14):   **Exam 1**
Week 07 (02/17 – 02/21):   Series and patterns
Week 08 (02/24 – 02/28):   Functions / debugging
Week 09 (03/09 – 03/13):   Vectors and Matrices – part 1
Week 10 (03/16 – 03/20):   Vectors and Matrices – part 2
Week 11 (03/23 – 03/27):   **Exam 2**
Week 12 (03/30 – 04/03):   Strings
Week 13 (04/06 – 04/10):   Images – part 1
Week 14 (04/13 – 04/17):   Images – part 2
Week 15 (04/20 – 04/22):   **Exam 3**

Attendance Policy

Class attendance is **REQUIRED.** Attendance will be taken at the beginning of class and all students must be present for their attendance to count. Each week in class, students will complete in-class activities related to the current class topic which must be turned in before leaving the class that day. **It is important to note that students are NOT allowed to submit in-class activities without attendance**. Attendance is also required for all the exams; every student must physically present to take the exams. Excused absences must be consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation.

Class Expectations

This course runs on a flipped classroom design. Every week students will be expected to watch the content videos for a particular module and complete a quiz based on it before coming to class. In the class students will be expected to complete 2-3 activities and they will have an opportunity to ask any questions to the instructor or peer mentor. The activities have to be done in the class and students are expected to submit the activities before the class ends. **Each student's lowest-graded quiz and in-class activities will be dropped.** A homework assignment will be due on Tuesday (Sections EE03, EE06) or Sunday (Section EE08). Please note that **there will be NO dropped homework grades.**

Make-Up Policy

Makeups for exams, quizzes, in-class activities, and homework assignments are NOT normally allowed. If you cannot attend an exam, you must contact the instructor well in advance. Submitting an exam, quiz, activities, or assignments late will result in a zero. Arrangements will be made for students on a case by case basis for excused reasons. Failure to contact the instructor prior to the exam or quiz will result in a zero. **You are allowed to submit homework assignments up to 24 hours late with a penalty of 20 points**. It is every student's responsibility to honor and respect the given deadlines posted on Canvas.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Quizzes (10)	10 each	10%
In-class activities (11)	100 each	15%
Homework Sets (8)	100 each	30%
Exam 1	15	15%
Exam 2	15	15%
Exam 3	15	15%
		100%

Grading Policy

Percent	Grade	Grade Points
90.0 - 100	A	4.00
87.0 - 89.99	B+	3.33
80.0 - 86.99	B	3.00
77.0 - 79.99	C+	2.33
70.0 - 76.99	C	2.00
67.0 - 69.99	D+	1.33
60.0 - 66.99	D	1.00
0 - 59.99	E	0.00

More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Graduate Program Coordinator
• Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources: