Computer Programming for Engineers: MATLAB

Academic Term: Summer 2020

COP2271 Section EED1

Class Periods: Tuesday (9:30 AM to 12:15 PM) ***Location:*** Online on Zoom

COP2271 Section EED3

Class Periods: Wednesday (11 AM to 1:45 PM) ***Location:*** Online on Zoom

Instructor:
Ashish Aggarwal
ashishjuit@ufl.edu
Office Phone Number: 352-294-1385
Online Office Hours: TBA through Canvas page. Check out the 'Start Here' module on Canvas.

Teaching Assistant/Peer Mentor/Supervised Teaching Student: TBA
Please contact through the Canvas page. Check out the 'Start Here' module on Canvas.

Course Description
Computer programming and the use of computers to solve engineering and mathematical problems. Emphasizes applying problem-solving skills. An intensive 2 credit course for students pursuing technical careers in fields employing a reasonably high degree of mathematics. The programming language used depends on the department. In one semester, several languages may be taught, but no more than one per section. Students are required to learn a specific language must enroll in the correct section.

Course Pre-Requisites / Co-Requisites
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 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.

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	Medium

consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	
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. We will use the Canvas course site (http://lss.at.ufl.edu) **EXTENSIVELY** to post course material. It will be every student's responsibility to be familiar with the material posted on the course web site.
- MATLAB Student Version (any recent version should be fine)
  You may consider using **UFApps** to access a number of popular software applications for "free" including MATLAB at: http://info.apps.ufl.edu/ ; MATLAB is also available for purchase and download at: http://www.mathworks.com/academia/student_version/index.html

Recommended Materials

- 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 (05/11 – 05/15): Introduction to Information, Technology and Computers
Week 02 (05/18 – 05/22): MATLAB interface, user input and output, variables, operators
Week 03 (05/25 – 05/29): Flow control: if statement
Week 04 (06/01 – 06/05): While loops, break, continue
Week 05 (06/08 – 06/12): For loops, nested flow control
Week 06 (06/15 – 06/19): Series and patterns based computation, **Exam-1**
Week 07 (06/22 – 06/26): Summer Break
Week 08 (06/29 – 07/03): Summer Break
Week 09 (07/06 – 07/10): Matrices and vectors (arrays)
Week 10 (07/13 – 07/17): Strings and ciphers
Week 11 (07/20 – 07/24): Pixels and image manipulation
Week 12 (07/27 – 07/31): Binary images and thresholding
Week 13 (08/03 – 08/07): Matrix concatenation, **Exam-2**
Week 14 (08/10 – 08/14): Functions, data analysis and plotting; Advance topics and Computational ethics

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 the class. In the class students will be expected to complete 3 activities and they will have an opportunity to ask any questions to the instructor or peer mentors. The activities have to be done in the online class and students are expected to submit the activities before the class ends. A homework assignment will be due before the next week.

Attendance Policy
Class attendance is **required** except for excused absences which must be documented in advance (except for emergencies). Furthermore, attendance will be taken at the beginning of class and all students must be present for their attendance to count and to receive credit for the in-class activities. **Each student is allowed to drop 1 class grade (one quiz and one in-class activity), no questions asked.** Each week in the class, students will complete activities related to the current class topic which must be turned in before leaving the class that day. Attendance is also required for both the exams (any exceptions must be discussed with the instructor in the first week of class)!

Make-Up Policy
Makeups for exams, quizzes, in-class activities, homework assignments and the final project are not normally allowed. If you cannot attend an exam, you must contact the instructor well in advance. Submitting an exam, quiz, activities, assignments or final project 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, quiz, or final project will result in a zero. **You are allowed to submit homework assignments up to 24 hours late with a penalty of 20 points.** This only applies to homework and not the final project or extra credit assignments. It is the student's responsibility to honor and respect the given deadlines posted on Canvas (http://lss.at.ufl.edu).

Evaluation of Grades
Homework is assigned through Canvas. **Please note the deadlines are strictly enforced and there are no dropped homework assignments.** For example if the deadline is 11:59 pm, any assignment submitted after this time is considered late. It is also your responsibility to submit the correct file and ensure the submission was successful before the deadline (please double check your Canvas submissions). If you are unable to submit your homework through Canvas, send a copy of your assignment to your instructor before the stated deadline!
There will be two regular exams and a final project. All exams must be taken in person and will emphasize the most recently covered material. Exam details will be announced in class and posted on the course website.

Assignment	Total Points	Percentage of Final Grade
Quizzes (12)	10 each	10%
In class Activities (12)	100 each	15%
Homework Sets (8)	100 each	20%
Exam-1	100	20%
Exam-2	100	20%
Final Project	100	15%
		100%

Grading Policy

Percent	Grade	Grade Points
90.0 - 100	A	4.00
87.0 - 89.9	B+	3.33
80.0 - 86.9	B	3.00
77.0 - 79.9	C+	2.33
70.0 - 76.9	C	2.00
66.7 - 69.9	D+	1.33
60.0 – 66.6	D	0.67
0 - 59.9	E	0.00

Note: A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better).

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 feedback on the quality of instruction in this course by completing online evaluations at https://gatorevals.aa.ufl.edu/. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments 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:

Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process.