

Computer Programming for Engineers: MATLAB

Academic Term: Fall 2020

COP2271 Section EE01

Class Periods: Monday, Period 4-5 (10:40 AM to 12:35 PM) **Location:** Online via Zoom (Synchronous)

COP2271 Section EE06

Class Periods: Monday, Period 6-7 (12:50 PM to 02:45 PM) **Location:** Online via Zoom (Synchronous)

COP2271 Section EE04

Class Periods: Tuesday, Period 4-5 (10:40 AM to 12:35 PM) **Location:** Online via Zoom (Synchronous)

Instructor:

Ashish Aggarwal

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Office Phone Number: 352-294-1385

Online Office Hours: Fridays 3 pm to 5 pm

Teaching Assistant/Peer Mentors

Joshua McHarris (mcharrisj@ufl.edu) and Hely Lin (helylin@ufl.edu)

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 as a software solution.

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
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	High
3. An ability to communicate effectively with a range of audiences	Low
4. An ability to recognize ethical and professional responsibilities in engineering situations and make	Medium

informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
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	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	High

*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 (<https://elearning.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 (08/31 – 09/04):	Introduction to Information, Technology and Computers
Week 02 (09/07 – 09/11):	MATLAB interface, user input and output, variables, operators
Week 03 (09/14 – 09/18):	Flow control: if statement
Week 04 (09/21 – 09/25):	While loops, break, continue
Week 05 (09/28 – 10/02):	For loops, nested flow control
Week 06 (10/05 – 10/09):	Series and patterns based computation
Week 07 (10/12 – 10/16):	Exam-1
Week 08 (10/19 – 10/23):	Matrices and vectors (arrays)
Week 09 (10/26 – 10/30):	Strings and ciphers
Week 10 (11/02 – 11/06):	Pixels and image manipulation
Week 11 (11/09 – 11/13):	Binary images and thresholding
Week 12 (11/16 – 11/20):	Matrix concatenation
Week 13 (11/23 – 11/27):	Exam-2 and thanksgiving break
Week 14 (11/30 – 12/04):	Functions, data analysis and plotting
Week 15 (12/07 – 12/11):	Computational ethics and advance topics, final project submission

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 online 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 completed 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

Weekly online classes will be held synchronously via zoom. **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. **As in all courses, any unauthorized recording of the class and unauthorized sharing of recorded materials is prohibited.**

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 (<https://elearning.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 online using Honorlock** and will emphasize the most recently covered material. Exam details will be posted on Canvas (<https://elearning.ufl.edu>).

Assignment	Total Points	Percentage of Final Grade
Quizzes (12)	10 each	10%
In class Activities (12)	100 each	15%
Homework Sets (9)	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>

Academic Dishonesty

- **Sharing or copying of code** through any medium such as email, text, snapchat etc., and plagiarism, in addition to other dishonest behaviors, are all considered to be academic dishonesty. No information regarding the project, quiz, and exam solutions may be shared by students except for a discussion at a conceptual level.
- Collaboration (helping out others at a conceptual level through discussions) is encouraged in the course. However, looking at any piece of your peer's code, sharing files, searching for solutions found online, or using someone else to code your solution is strictly prohibited.
- Any student found to have violated these rules, whether a provider or receiver of an unauthorized help, will be given a zero on that assignment and will be reported to the Honor Court. If you aren't clear on what constitutes plagiarism, ask the course staff.
- **We strongly encourage you to visit the course staff in-office hours whenever you have doubts.**

Online Exams through Honorlock

- Honorlock will proctor your exams this semester. Honorlock is an online proctoring service that allows you to take your exam from the comfort of your home. You DO NOT need to create an account, download software or schedule an appointment in advance.
- Honorlock is available 24/7 and all that is needed is a **computer**, a **working webcam**, and a **stable Internet connection**. To get started, you will need Google Chrome and to download the Honorlock Chrome Extension. You can download the extension at www.honorlock.com/extension/install.
- When you are ready to test, log into Canvas, go to your course, and click on your exam. Clicking "Launch Proctoring" will begin the Honorlock authentication process, where you will take a picture of yourself, show your ID, and complete a scan of your room. Honorlock will be recording your exam session by webcam as well as recording your screen. Honorlock also has an integrity algorithm that can detect search-engine use, so please do not attempt to search for answers, even if it's on a secondary device.
- Honorlock support is available 24/7/365. If you encounter any issues, you may contact them by live chat, phone (**844-243-2500**), and/or email (**support@honorlock.com**).

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](mailto:title-ix@ufl.edu), 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 support, 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>.