

Computer Applications for BME
BME 3053C Section 2277
Class Period: Friday, Period 7-10, 1:55PM – 6:00PM
Location: CSE E231
Academic Term: Spring 2020

1. **Instructor:** Parisa Rashidi

- E-mail address: parisa.rashidi@ufl.edu
- Office location: NEB 459
- Telephone: 352-392-9469
- Website: Canvas Page
- Office hours: email the instructor for the appointment.

2. **Teaching Assistants:**

- TA: Jianqiao Tian. Office Location: TBD. Message TA on Canvas for appointment.
- Grader: TBD.

3. **Description:** (2 credit hours) – Computer programming lab to utilize MATLAB to analyze biomedical measurements.

4. **Pre-requisites and Co-requisites:** COP 2271 and COP 2271L or equivalent and MAC 2312, with minimum grades of C.

5. **Course Objectives:**

- Develop a proficiency in the use of *computer programming* (specifically, MATLAB) to analyze biomedical measurements.
- Develop an understanding of *biomedical engineering problems* that require quantitative analysis and visualization.

6. **Contribution of course to meeting the professional component (ABET):** 2 credits of engineering topics (no design component)

7. **Relationship of course 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	Medium
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 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	Medium

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	

8. **Class/laboratory schedule:** one 50- minute lecture session per week, remaining time devoted to lab work.

9. **Material and Supply Fees:** N/A

10. **Textbooks and Software Required**

- Title: MATLAB, A Practical Introduction to Programming and Problem Solving
- Author: Stormy Attaway
- Publication date and edition: 2018, 5th edition
- ISBN number: 9780128154793
- Required software: MATLAB (info.apps.ufl.edu or in CSE Active Learning Lab)

11. **Recommended Reading:**

- Title: MATLAB for Engineering and the Life Sciences
- Author: Tranquillo, Joseph
- Publication date and edition: 2011, 1st edition
- ISBN number: 9781608457113

12. **Course Outline:** tentative schedule, subject to change.

Week	Topic	Reading	HW	Quiz
Part 1: Fundamental MATLAB Programming				
1	Logistics & Introduction to MATLAB	Ch. 1	HW 0	Quiz 0
2	Vectors and Matrices	Ch. 2	HW 1	
3	Matrix Operations	Ch. 2	HW 2	
4	Matrix Vector Operations	Ch. 2	HW 3	Quiz 1
5	Script and Function	Ch. 3,5	HW 5	Proposal
Part 2: Advanced MATLAB Programming				
6	Fourier Transform	Slides	HW 6	
7	Convolution	Slides	HW 7	Quiz 2
8	Medical Image Analysis	Slides	HW 8	
9	Signal Processing	Slides	HW 9	
10	Image Processing I	Slides	HW10	Quiz 3
11	Image Processing II	Slides	HW11	
12	ML-Classification	Slides	HW12	Quiz 4
13	Project Presentation & Demo			Project
14	Final Exam Review			
15	Lab Exam			Exam

13. **Attendance and Expectations:** On time class attendance is expected.

Expectations:

- Be to class on time.
- no cell phone disruptions or e-device distractions except for lab computers.
- turn in homework on time
- do not copy code from others (very important!)
- better late than never
- ask for help if you need it

14. **Evaluation of Grades:**

Assignments	Total Points	Percentage of Final Grade
Homework Sets (13)	100 each	30%
Quizzes (4)	100 each	10%
Lab Exam	100	30%
Final Project	100	30%
Total		100%

Homework is due at end of each class in class.

The homework with the lowest score will be dropped.

Quizzes are graded on attendance only with bonus points for top 3.

Lab exam will consist of a programming assignment to be completed during the exam period. The Final project can be a group project, but the scope should be adjusted accordingly.

15. **Grading Scale:**

Points	Grade	Grade Points
93.00 - 100.00	A	4.00
90.00 - 92.99	A-	3.67
87.00 - 89.99	B+	3.33
83.00 - 86.99	B	3.00
80.00 - 82.99	B-	2.67
77.00 - 79.99	C+	2.33
73.00 - 76.99	C	2.00
70.00 - 72.99	C-	1.67
67.00 - 69.99	D+	1.33
63.00 - 66.99	D	1.00
60.00 - 62.99	D-	0.67
0 - 59.99	E	0.00

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). Note: a C-

average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

16. **Make-up Exam Policy** – Exams can be rescheduled for an individual due to sickness or religious holidays. The instructor *must* be notified in advance.

17. *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.

18. *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/>.

19. *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.

Plagiarism

Plagiarism is a common infraction to the UF Honor Code. If you are confused as to what constitutes plagiarism, see here: <https://guides.uflib.ufl.edu/copyright/plagiarism>. Plagiarism on any of your assignments **will be reported to the Dean of Students as a UF Student Honor Code violation**. Also, note that **copying solutions for any assignment, regardless of the source (e.g. other students, pirated website solutions), will be treated as plagiarism**. If you have any questions or concerns, please consult with the instructor in this class. Note that failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures.

20. 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

21. 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.

22. 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>

23. 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 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>.