

BME 3053C: Computer Applications for BME

1. **Description:** (2 credit hour) – Computer programming lab to utilize MATLAB to analyze biomedical measurements.
2. **Pre-requisites and Co-requisites:** COP 2271 or equivalent and MAC 2312.
3. **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.
4. **Contribution of course to meeting the professional component:** 2 credit of engineering topics (no design component)
5. **Relationship of course to program outcomes:**
 - (a) Ability to apply knowledge of math, science, engineering
 - (e) Ability to identify, formulate, solve engineering problems
 - (k) Ability to use techniques, skills, and tools for engineering practice
6. **Instructor:** Ruogu Fang
 - a. Office location: BMS 395
 - b. Telephone: (352) 294-1375
 - c. E-mail address: ruogu.fang@bme.ufl.edu
 - d. Web site: <http://www.bme.ufl.edu/labs/fang/>
 - e. Office hours: Tuesday 5:00 pm – 6:00 pm
7. **Teaching Assistant:**
 - a. Sreenivasan Meyyappan: smeyyappan@ufl.edu
 - b. Yuanpu Xie: shampool@ufl.edu
 - c. Anis Davoudi: anisdavoudi@ufl.edu
8. **Meeting Times:** Tuesday, period 6 (12:50 pm-1:40 pm)
9. **Class/laboratory schedule:** three 50 minute session per week (Tuesday 1:55pm-4:55pm)
10. **Meeting Location:** LIT 101 (Lecture), CSE E231 (Lab)

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

12. **Textbooks and Software Required**

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

Required software: MATLAB (info.apps.ufl.edu or in CSE Active Learning Lab)

13. **Recommended Reading:** see 12 above

14. **Course Outline**

Week	Topic	Reading	Homework
1	Introduction and Matlab Programming Environment	Ch. 1 & 2	
2	Graphics, vector space, matrices	Ch. 3	HW 1
3	Matrix algebra	Ch. 4 & 5	HW 2
4	Scripts and functions, loops and logics	Ch. 6 - 8	HW 3
5	1D signals, Fourier analysis	Slides	HW 4
6	Curve fitting	11.2	HW 5
7	Signal processing using Matlab	11.4	HW 6
8	Image display and filtering	Ch. 10	HW 7
9	Basic image acquisition and processing	Ch. 9	HW 8
10	Image analysis using Matlab	Slides	HW 9
11	Image analysis using Matlab	Slides	HW 10
12	Video processing using Matlab	Slides	HW 11
13	Optimization using Matlab	Slides	Quiz
14	BME Lab demonstration1		
15	BME Lab demonstration2		
16	Lab exam		

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

Expectations:

- Be to class on time.
- no cell phone disruptions or e-device distractions.
- turn in homework on time and make legible
- ask for help if you need it

16. Grading:

60% Homework; 25% Lab Exam, 15% Final Project

Homework is due at end of each class in class.

Lab exam will consist of a programming assignment to be completed during the exam period. The final project will be a group work.

17. Grading Scale:

A = 94 – 100

A- = 90 – 93.99

B+ = 87 – 89.99

B = 83 – 86.99

B- = 80 – 82.99

C+ = 77 – 79.99

C = 73 – 76.99

C- = 70 – 72.99

D = 61 – 69.99

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>

18. Make-up Exam Policy – Exams can be rescheduled for an individual due to sickness or religious holidays. The instructor *must* be notified in advance. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

19. 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 (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-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.

Note that failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures.

See <http://www.dso.ufl.edu/sccr/procedures/honorcode.php>

Unless otherwise stated, all homework for this class must be done individually. *In this class, it is a violation of the Academic Honesty code to obtain assistance on homework assignments from other individuals without acknowledging such.*

20. **Accommodation for Students with Disabilities** – Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, 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.
21. **UF Counseling Services** – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
 - UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
 - Career Resource Center, Reitz Union, 392-1601, career and job search services.
 - SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling
 - Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling
 - Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling
22. **Software Use** – All faculty, staff, and student 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.
23. **Online Course Evaluation:** Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.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://evaluations.ufl.edu/results/>.