

## **BME 3053L: Computer Applications for BME**

1. **Description:** (1 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:** 3 credits 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:** David Gilland
  - a. Office location: room 111 Building 1917 (BME/Medical Physics)
  - b. Telephone: 273-0302
  - c. E-mail address: gilland@ufl.edu
  - d. Web site: [www.bme.ufl.edu/people/gilland\\_david](http://www.bme.ufl.edu/people/gilland_david)
  - e. Office hours: email for appointment
7. **Teaching Assistant:** N/A
8. **Meeting Times:** Tuesday, period 3 (9:35-10:25)
9. **Class/laboratory schedule:** one 50 minute session per week
10. **Meeting Location:** 316 CHE
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, 1<sup>st</sup> edition

d. ISBN number: 9781608457113

Required software: Matlab (info.apps.ufl.edu)

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

14. **Course Outline**

Topic	Week
Matlab interface, basic operations	1
Figures, plotting: 2D, 3D	2
Matrices, matrix operations/algebra, script files	3
Matrix algebra II	4
Logic and flow control, functions	5
Debugging matlab code, sections	6
Data file formats, data input/output	7
1D signals, Fourier analysis	8
Curve fitting	9
Data smoothing	10
2D image display, gray scale mapping	11
Image filtering/processing	12
BME Lab demonstration	13
Simulink	14
Lab exam	15

15. **Attendance and Expectations:** On time class attendance is required. Chronic tardiness or absence will negatively impact the final grade.

Expectations:

- Be to class on time.
- no cell phone disruptions or e-device distractions.
- turn in homework on time and make legible
- better late than never
- ask for help if you need it

16. **Grading:**

75% Homework; 25% Lab Exam

Homework is due at beginning of class on due date. Late submission will impact grade.

Lab exam will consist of a programming assignment to be completed during the exam period.

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.
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 Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.
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. 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/>.