BIOM 1720: Introduction to Biomedical Engineering Tools
(Syllabus)

Stephen Strain

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BIOM 1720 Introduction to Biomedical Engineering Tools  
Spring 2021  
Tuesday-Thursday 11:20A-12:45P

Instructor  
Dr. Stephen Strain  
sfstrain@memphis.edu  
Office: ET308  
Virtual Office: https://memphis.zoom.us/j/3271381594  
(Note: This is not the link to class!!)  
Office hours: Friday 1:30-3:30P, or email for appointment

Teaching Assistant: TBA

Required Materials for Remote Access:  
- Internet Access,  
- Desktop Computer, Laptop, or Tablet  
- eCourseware (elearn.memphis.edu)  
- Zoom (memphis.edu/umtech/teaching/ummedia/zoom.php)  
See eCourseware for the link to connect to the online class during regular class hours.  
Preferred is a combination laptop/tablet.  
University resources to support online learning:  
https://www.memphis.edu/umtech/teaching/ecwstudent.php

Interactive Textbook (required):  
Programming in MATLAB, zyBooks.com  
1. Sign in or create an account at learn.zybooks.com  
2. Enter zyBook code: MEMPHISBIOM1720StrainSpring2021  
3. Subscribe

Required software: MATLAB, Microsoft Word, and Microsoft Excel.

A free MATLAB download is available for UM students through the university’s site license at  

MS Word & Excel is available for UM students through the university’s technology access program at  
https://www.memphis.edu/umtech/solutions/software/software.php

MATLAB notebook:  

Course Learning Outcomes  
- Use algorithms and logic to design computer programs in a high-level programming language (MATLAB)  
  o Make use of arrays/matrices  
  o Develop custom functions  
  o Implement graphing in two dimensions  
- Become familiar with various areas of biomedical engineering including biomechanics, biomaterials, and bioelectricity  
  o Make physiologic and material measurements  
  o Use physiologic models  
  o Gain understanding of integration of mathematics and physical sciences in engineering  
- Become skilled at technical documentation and report writing
Course Topics
- MATLAB programs and built-in functions
- MATLAB input/output and plotting
- MATLAB logical functions and control structures
- Tensile testing of biomaterials
- Technical writing
- Data analysis and graphical presentation
- Team project incorporating MATLAB

Grading

- % Attendance (pass/fail)
- 20% Homework
- 20% Individual Technical Reports
- 15% Team Project
- 15% Exam 1
- 15% Exam 2
- 15% Final Exam

Note: The grading scheme may be revised as required during the term.

Attendance (pass/fail)
For the first weeks, class will be held remotely. After that, if possible, hybrid classes will be held. The link for online attendance can be found on eCourseware.
- Attendance at all class meetings is required.
- You are allowed three unexcused absences.
- A fourth unexcused absence will result in an “F” for the course.
- Absences will be excused at my discretion, for instance, for circumstances such as illness, personal/family emergency, academic/professional commitments, etc. must be documented via an email to Dr. Strain. Student athletes may provide scheduled absences for athletic events per usual methods.

Homework (20%)
Homework consists of required assignments and must be submitted as directed, such as uploaded to eCourseware (elearn.memphis.edu) or completing activities in Programming in MATLAB (zyBooks.com). Homework assignments will not be accepted via email. Homework assignments are graded and must be turned in by the specified deadline. Approximately three (3) homework grades will be dropped, allowing for such circumstances as time management issues or inadequate preparation. Late assignments may be accepted for other special circumstances at the discretion of the instructor.

Technical Reports (20%)
Individual technical reports are required. These reports will be based on laboratory activities completed during class. Instruction on technical writing and report rubrics will be provided. Drafts will be turned in first, and feedback will be provided. This will resemble the peer review process. Then revisions must be made and a revised, final report turned in.
- Failure to revise the final report according to the draft feedback will result in an F on the final report.
- Failure to turn in the final report will result in an “F” for the course.

Team Project (15%)
A team project is required. Detailed instructions, deliverables, and grading scheme will be provided. Teammates will be assigned by the instructor.
Exams (45%)
Three (3) exams will be given; two during the semester and a final exam. The final exam is not comprehensive; however, MATLAB topics build upon previous topics and the final exam will include topics from previous exams. Exam dates will be posted to eCourseware.

Policies
1. E-mail and eCourseware are considered essential paths for instructor-to/from-student communication. You are responsible for any information sent to your University of Memphis e-mail address (UUID@memphis.edu) or posted to eCourseware (elearn.memphis.edu) in the same manner as you are responsible for written materials distributed in the classroom. When sending email to your instructor, include the text ‘BIOM 1720’ in the subject line and your first and last name in the body of the message. If the aforementioned text does not appear in the subject line, your email may be disregarded and/or deleted.

2. You are responsible for all material, whether covered in class or as part of an assignment. If you miss a class, you are responsible for obtaining any material covered in class.

3. You are expected to come to class prepared and to participate actively in class. This participation may include, but not be limited to, explanation or demonstration of concepts, in-class problem solution, or discussion of assignments. Volunteers for participation may be solicited, or you may be called upon.

4. There will be regular assignments, and many of them will be graded. You are expected to complete and understand all assignments, whether they are graded or not.

5. Except when teamwork is specifically required, any work submitted for a grade must be your own original work. Working together on assignments is certainly acceptable and encouraged, but each person must work through the problem individually. Do not simply copy someone else’s solution. Do not electronically share your assignment files with classmates.

6. Make-up exams will be given at the discretion of the instructor. Alternately, if your absence from an exam is officially excused (documentation required), then you may replace the missed exam grade with your final exam grade. A grade of zero will be assigned for a missed exam in all other cases.

7. Academic dishonesty and disruptive behavior of any form will not be tolerated. See the Code of Student Rights and Responsibilities at www.memphis.edu/studentconduct. See the section on Academic Integrity below.

8. You are responsible for determining the availability of the computing resources used in this class and for scheduling your work accordingly.

9. You must fully comply with all university guidelines and applicable laws regarding the use of computing facilities and software that may be provided for this course.

10. You should bring your own laptop to class. The computer and wireless usage policy is as follows: (a) Checking email and social websites, surfing, gaming, or other activities not directly related to the assigned task is not appropriate. (b) Cell phone usage, including text messaging, is not appropriate at any time during class unless instructed to do so.

11. Please treat the classroom environment as you would for any professional situation: be on time, be prepared, be respectful, do not disrupt or distract others.
Academic Integrity
The University of Memphis expects all student to behave honestly. The Code of Student Rights & Responsibilities explains what constitutes a violation of our Academic Integrity policy. Please see the website for more information: https://www.memphis.edu/osa/. Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students who violate the academic misconduct policy, either directly or indirectly, through participation or assistance, are immediately responsible to the instructor of the class in addition to other possible disciplinary sanctions which may be imposed through the regular institutional disciplinary procedures.

COVID-19 Health and Safety Policy - Masks and Social Distancing
All students, faculty and staff will wear masks in all public spaces, including our classroom (lab) per the COVID-19 policy. The first time a student enters a classroom without wearing a face covering, the student will be asked to leave the class until they return a covering. Further violations will be referred to the Office of Student Accountability. Students who repeatedly or flagrantly violate these community expectations may be referred for discipline under the Student Code and, if appropriate, immediately removed from campus by the Dean of Students.

Student Health
Students who are experiencing symptoms such as sneezing, coughing or a higher than normal temperature should inform me by email so they can be excused from class and should stay home. Students should contact their health care provider or the Student Health Center at https://www.memphis.edu/health/. Students who have a positive COVID-19 test should contact the Dean of Students at deanofstudents@memphis.edu.

Student Accommodations
Students with accessibility issues or learning accommodation issues due to a disability should contact Disability Resources for Students (DRS) to submit an official request for course accommodations. Contact DRS at 901.678.2880 or at drs@memphis.edu. (https://www.memphis.edu/drs/index.php)

If and when we return to class, students seeking to remain remote for health or other serious reasons should discuss their options with me.

Student Resources
Students who need additional resources can contact the Dean of Students Office at https://www.memphis.edu/deanofstudents/crisis/index.php.

Note: Policies may be revised during the term at the instructor’s discretion.