2021

BIOM 2720: Experimental Design and Analysis for Biomedical Engineering (Syllabus)

Stephen Strain  
*University of Memphis*

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Hello! I am Dr. Strain. Welcome to BIOM 2720.

The plan is for us to have face-to-face classes this fall. We will meet in ET 233. Due to uncertainty regarding the pandemic, this could change. It is imperative that you check your UM email and eCourseware daily for announcements regarding the course.

Per current University policy, masks are REQUIRED in class, even if you are vaccinated.

Please feel free to contact me with any questions, concerns, etc. that you might have.

I look forward to hearing from you!

Use University email only—my address is sfstrain@memphis.edu. Please include “BIOM 2720” in the subject line when you write. Do NOT use the messaging system within eCourseware to contact me (I probably won’t see the message).

Instructor
Dr. Stephen Strain
sfstrain@memphis.edu
Office: ET308
Virtual Office: https://memphis.zoom.us/j/3271381594?pwd=VW9FYThrS293d0FwYUZ2TVFyeVJLdz09
Office hours: MW 2:15-3:30P, or email for appointment

Teaching Assistant: Clayton Rudolph (crdolph1@memphis.edu)

Required Materials:

- Internet Access,
- Desktop Computer, Laptop, or Tablet
- eCourseware (elearn.memphis.edu)

Preferred is a combination laptop/tablet.

University resources to support online learning:
https://www.memphis.edu/umtech/teaching/ecwstudent.php

Course Description
Application of probability, statistics, error analysis, uncertainty in design and performance of biomedical engineering experimentation; discussion and evaluation of common experimental designs for medical device development. PREREQUISITE: BIOM 1720 and MATH 1910.

This course is required for the Biomedical Engineering Degree Program.

Textbook (optional)

A personal computer is required.

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

A free MATLAB download is available for UM students through the university’s site license at https://www.mathworks.com/academia/tah-portal/university-of-memphis-40714972.html
BIOM 2720 Experimental Design and Analysis for Biomedical Engineering  
Fall 2021  
Tuesday-Thursday 11:20-12:45P  
ET 233

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

Objectives
1. To teach students to present data and compute summary statistics in biomedical engineering using computer programs
2. To teach students basic concepts and commonly used methods of experimental design and analyses.
3. To teach students how to perform and interpret basic statistical analyses used in biomedical engineering design and testing.

Competencies
1. Make well organized tables and graphs. This requires appropriate table titles and figure legends, correct units and axis labels (including formatting and significant digits) clear indication of types of descriptive statistics, sample sizes and overall labeling and organization.
2. Clearly state statistical hypotheses.
3. Correctly perform statistical tests of significance.
4. Correctly interpret results of statistical tests of significance.

Grading
10% Attendance/pop-quizzes/in-class participation
15% Homework
30% Exams
25% Final
20% Labs/Reports*

*Competencies will be evaluated and graded as part of submitted lab reports. Passing competencies will constitute 11 points of the final lab report grade. Students will have 3 chances to pass competencies in each lab.

Letter grades will be determined as below, with plus/minus modifiers for A, B, or C grades and plus modifier for D grade. Modifiers are applied if numerical grade is above X7.5% or below X2.5%. I reserve the right to round up or down or otherwise adjust the final grade based on other factors such as attendance, effort, and engagement inside and out of class.

A: (90-100); B (80-89); C (70-79); D (60-69); F (<59)

Attendance
In order to be successful in this class, attendance is MANDATORY. You are allowed at most three unexcused absences.

If you have a health condition that prevents you from regular class attendance, you MUST register with Disability Resource Services (see Student Accommodations below) and contact me to discuss an alternative plan ASAP.

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

1. You are responsible for all material, whether covered in class or as part of an assignment.
2. 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 solving, 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 collected and graded. You are expected to complete and understand all assignments, whether they are graded or not.
5. Except when collaboration and teamwork is specifically encouraged or required, any work submitted for a grade must be your own original work. Working together on homework is certainly acceptable, but each person must work through the problem individually. Do not simply copy someone else’s solution.
6. Homework assignments must be turned in by the due date in eCourseware. Assignments cannot be submitted by email. No late assignments will be accepted.
7. No make-up exams will be given. If your absence from an exam is officially excused (documentation required), an alternate exam time may be scheduled at the discretion of the instructor. A grade of zero will be assigned for a missed exam in all other cases.
8. Make-up lab assignments will be given at the discretion of the instructor(s).
10. You are responsible for determining the availability of the computing resources used in this class and for scheduling your work accordingly.
11. 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.
12. Please show up on time for class. Attendance is taken at the beginning of class and if you are not present, you will be marked as absent.
13. These policies may be revised or augmented as required during the term.

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: Until further notice, all students, faculty and staff will wear masks in all public spaces, including the classroom per the COVID-19 policy.

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).

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