

BIOE/STAT 440
STATISTICS FOR BIOENGINEERING
Syllabus - Fall 2022

Instructor

Dr. Bilal Ghosn
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Course Room: Keck 102
Office Hours: MW 11 AM – 12 PM
or by appointment

Teaching Assistants

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Meeting Times and location

Lecture: Tuesdays, 9:25 AM to 10:40 AM in Keck 102
Discussion Session: Thursdays, 9:25 AM to 10:40 AM in Keck 102

Pre-/Co-requisites

BIOE 252

Course Description

This semester long course will cover the introduction of students to the application of basic statistics for bioengineering. This will include the theory and application behind descriptive stats, probability distributions, sampling, estimation, preparing scientific studies, student t-tests, ANOVA, linear and multiple regressions. After successful completion of this course, students should be able to use analytical tools, such as Excel, to design basic experiments, determine statistical parameters, test hypothesis, and come to supported conclusions.

Required Text

The text, Biostatistics: A Foundation for Analysis in the Health Sciences, 10th edition, by Wayne Daniel (2013). This is an important reference book to have as a practicing engineer or scientist.

Course Content

In this course students will be expected to attend all lectures and be attentive in class. Students will be assigned a homework assignment following each class as well as two exams which may or may not be take home exams, dependent on the class performance. Daily homework assignments will be due the next Tuesday following their assignment, unless otherwise noted. Assignments must be turned in to the course website in Canvas. While family emergencies and illnesses can come up, it is the responsibility of the student to inform Dr. Ghosn immediately and then a determination will be made on a case by case basis.

The homework assignments, which may be assigned in tandem due to the compressed nature of this course, will be worth 10 points per question. Late homework will not be accepted. Students must complete at least 60% of the homework assignments to pass the course. The exams will be given on the tentative dates shown in the schedule below and may come in the form of an in-class or take-home format at the discretion of the instructor.

Details on the course project will be provided at a later date with requirements and expectations.

Grading Breakdown:

Homework	20%
Exam #1	35%
Exam #2	35%
Project	10%

Honor Code Policy

Students are expected adhere to the Rice Honor Code at all times. All graded work will be covered by the code, which will be distributed to students on the first day of class. It is the responsibility of the students to inquire with the instructor on any concerns, questions, or needed clarifications on the expectations with regards to academic integrity.

Failure to comply with the Rice Honor code can result in a zero grade on the offending assignment/material and students will be reported to student affairs for further evaluation.

Students with Disabilities

Any student with a documented disability needing academic adjustments or accommodation is requested to speak with me during the first two weeks of class. All discussions will remain confidential. Students with disabilities should also contact Disability Support Services in the Ley Student Center.

Tentative Course Schedule (subject to change)

Lecture times will be T at 9:25-10:40 AM in BRC 282. This course will run from August 22nd (Tuesday) to December 1st (Friday). Homework due dates are listed in the table and are subject to change only when notification is given by Dr. Ghosn.

Lecture Date	Tuesday	Tuesday/Friday (HWs/Exams)
Aug 22	<i>Lecture 1</i> Introduction	
Aug 29	<i>Lecture 2</i> Descriptive Statistics (Ch 2)	HW #1
Sep 5	<i>Lecture 3</i> Probability Distributions (Ch 4) Sampling (Ch 5)	HW #2
Sep 12	<i>Lecture 4</i> Sampling (Ch 5) Chapter 5	HW #3
Sep 19	<i>Lecture 5</i> Estimation (Ch 6) Hypothesis Testing (Ch 7)	<i>HW #4</i>
Sep 26	<i>Lecture 6</i> Hypothesis Testing (Ch 7)	HW #5
Oct 3	<i>Lecture 7</i> Hypothesis Testing (Ch 7) ANOVA (Ch 8)	<i>HW #6 / HW #7</i>
Oct 10	<i>Fall Recess – NO CLASS</i>	
Oct 17	<i>Lecture 8</i> ANOVA (Ch 8)	EXAM #1*
Oct 24	<i>Lecture 9</i> ANOVA(Ch 8)	<i>HW #8</i>
Oct 31	<i>Lecture 10</i> Linear Regression (Ch 9)	HW #9
Nov 7	<i>Lecture 11</i> Linear Regression (Ch 9)	HW #10
Nov 14	<i>Lecture 12</i> Multiple Regressions (Ch 10)	HW #11 HW #12
Nov 21	<i>Lecture 13 (if necessary)</i>	HW #13
Nov 28		EXAM #2*

***Note that exams may be moved to in class at the discretion of the instructor and due dates are for that week and not necessarily the date listed.**