MEEN 2110 Data Analysis Summer 2020

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Lecture Time: Tuesday & Thursday 08:00 a.m.-09:50 a.m.

Remotely Delivery Zoom lecture link:

https://unt.zoom.us/j/99615488261

Office Hours: Email to make appointment for Zoom Meeting

Required Textbook: Applied Statistics and Probability for Engineers; 6th Edition

Montgomery, Douglas C and Runger, George C

ISBN-13: 9781118539712; Nov 2013

Course Description: This is a required course in MEE program

The course is designed for the engineering students to use appropriate statistical methods for engineering problem solving in manufacturing, engineering testing, material synthesis, and etc. Students will have a good understanding of the concepts on probability, random variables, intervals, distributions, randomization, replications, and experimental errors. The knowledge learned from the course is to help the students to draw meaningful engineering conclusion from the data. The practical applications of these techniques will be discussed using the actual data and interpretation of the problems.

Pre-requisites: MATH2700; MEEN 1000. **Credit Hours**: 3 credit hours

Course Learning Outcomes (CLO):

Upon successful completion of this course:

1. students will understand the concepts of probability, random variables, confidence level, distributions, mean, variance, and standard deviation.
2. Students will have the knowledge on different data distributions to conduct effective data analysis and to make appropriate conclusions.
3. Student will learn to use z-distribution and t-distribution for data analysis
4. Students will learn to use Spreadsheet for the basic data analysis and plotting.
5. Students will learn the procedure to apply the statistical tools in engineering, such as finding the lower or higher percentile from the data distributions used for design value determination of an engineering product

ABET Student Learning Outcomes (SO)

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

CLO	ABET Student Outcomes (SO)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	X						
2	X						
3	X						
4	X						
5	X						

Grades:

Homework (8)	10%	≥ 90	A
Quizzes (highest 3/5)	10%	80-89.9	B
Exam #1 (Ch2 & 3)	25%	70-79.9	C
Exam #2 (Ch4, 6 &7)	25%	60-69.9	D
Final (Exam #3) (Ch 8 & 9)	25%	< 60	F
Class Participation	5%		
Total	100%		

MEEN 2110 Data Analysis Schedule Overview

Week	Date	Topic
#1	Jun. 2 Jun. 4	Overview of syllabus; Ch 2. Probability: Sample space; Random experiments; Counting tech
#2	Jun. 9 Jun. 11	Ch 2. Probability: Addition rules; conditional probability; total probability; Ch 2. Probability: Independence; random variables
#3	Jun. 16 Jun. 18	Ch 3. Discrete random variable: PDF & PMF; CDF; Mean; Variance; Ch 3. Discrete random variable: Binomial distribution
#4	Jun. 23 Jun. 25	Review and HW session; -Exam #1: covers Ch 2 and 3
#5	Jun. 30 Jul. 2	Ch 4. Continuous random variable: PDF & PMF; CDF; Mean; Variance; Ch 4. Continuous random variable: PDF & PMF; CDF; Mean; Variance;
#6	Jul. 7 Jul. 9	Ch 4. Normal distribution; Ch 6. Descriptive statistics: Stem-Leaf; Box plots
#7	Jul. 14 Jul. 16	Ch 7. Point estimate and sampling distribution: Exam #2: covers Ch 4, 6 and 7
#8	Jul. 21 Jul. 23	Ch 8. Statistical interval for a single sample: Normal; Variance given Ch 8. Statistical interval for a single sample: Normal; Variance unknown
#9	Jul. 28 Jul. 30	Ch 8. Statistical interval for a single sample: CI for Variance and St.D Ch 8. Statistical interval for a single sample: CI for large sample
#10	Aug. 4 Aug. 6	Ch 9. Test of hypotheses for a single sample: test on mean; Normal; Variance given Ch 9. Test of hypotheses for a single sample: test on mean; Normal; Variance unknown
	Aug. 7	Exam #3 (Final): covers Ch 8, 9