UNIVERSITY OF CONNECTICUT
CE 2210 & 2251: PROBABILITY AND STATISTICS IN CIVIL ENGINEERING
FALL 2015 COURSE SYLLABUS

CLASSROOM: CAST 212 **CLASS TIME:** MWF 2:30 – 3:20 PM

INSTRUCTOR: Sha A. Mamun, Ph.D.
Assistant Professor
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Phone: (860) 486-0489
Office Hours: Tuesday (2:00 – 4:00 PM) or By appointment *(Please email me)*

TEACHING ASSISTANT: Peter Watson Email: peter.watson@uconn.edu
Office hours: Thursday, 1:00 – 4:00 PM; Friday, 11:00 -12:00 PM
Office hours location: CAST 210

COURSE PREREQUISITE: Prerequisite: MATH 1122 or 1132 (or approved substitution) – generally it is required that the student have a background in calculus.

COURSE OBJECTIVES: The objective of the course is to introduce concepts and approaches from the field of probability, and statistics that can be applied to the analysis of problems in civil engineering

COURSE OUTCOMES: Students are expected to be able to do the following at the successful completion of the course:

1. Quantitatively and qualitatively describe data from experiments
2. Identify random variables for a given experiment and properties of random variables including mean, variance, and probability of events
3. Select appropriate distributions to represent the population being analyzed in an experiment
4. Identify appropriate statistics for summarizing data from experiments; subsequently estimate confidence intervals, and test hypothesis
5. Estimate relationships between dependent and independent variables and interpret results

WEBSITES:

- HuskyCT: http://learn.uconn.edu
- HuskyCT will be the center for communications for this course. Please check your email and the message board at HuskyCT regularly, as I will regularly post announcements.

REQUIRED TEXTBOOK:
Navidi, W. *Probability and Statistics in Civil and Environmental Engineering*, 4th Edition, McGraw Hill, 2015.

HOMEWORK: Homework will be assigned and collected in 9 sets on the dates indicated on the syllabus. No late homework will be accepted. Homework assignments will be posted on HuskyCT. It is expected that homework is printed neatly or typed. Illegible homework will be considered incomplete.

MID TERM EXAMS: There will be three mid-term examinations; each counts as 15% of the final grade. No makeup exams will be offered without prior arrangement with the instructor.

FINAL EXAM: The Final Exam is comprehensive with the date tentatively scheduled for Monday, December 14, 2015 from 3:30 – 5:30 pm in CAST 212. There will be a total of 9 questions.

GRADING: Each portion of the course work will contribute toward the final grade as follows:

CE 2251	Homework = 15% *(All 9 HW)*	Midterm Exams = 45% *(All 3 Exams)*	Final Exam = 40% *(All 9 Questions)*
CE 2210	Homework = 15% *(First 6 HW)*	Midterm Exams = 45% *(First 2 Exams)*	Final Exam = 40% *(First 6 Questions)*

GRADE SCALE

A	≥ 93%	C	73 – 76.9
A-	90 – 92.9	C-	70 – 72.9
B+	87 – 89.9	D+	67 – 69.9
B	83 – 86.9	D	63 – 66.9
B-	80 – 82.9	D-	60 – 62.9
C+	77 – 79.9	F	<60%

CE 2251 FALL 2015 – CLASS SCHEDULE

Week	Class	Topic	Reference Sections	Due
1	1	Sampling	N 1.1	
1	2	Summary Statistics	N 1.2	
1	3	Graphical Summaries	N 1.3	
2		*Labor Day – No Class*		
2	4	Probability: Basic Ideas & Counting Methods	N 2.1 – 2.2	
2	5	Conditional Probability & Independence	N 2.3	
3	6	Random Variables	N 2.4	HW1
3	7	Linear Functions of Random Variables	N 2.5	
3	8	Propagation of Error	N 3.1– 3.2	
4	9	Bernoulli & Binomial Distributions	N 4.1 – 4.2	HW2
4	10	Poisson Distribution	N 4.3	
4	11	Normal Distribution	N 4.5	
5	12	Lognormal & Exponential	N 4.6 - 4.7	HW3
5	13	Review for Midterm Exam 1		
5	14	**MIDTERM EXAM 1**	HW1 – HW3	
6	15	Principles of Point Estimation	N 4.9	
6	16	Central Limit Theorem	N 4.11	
6	17	Confidence Intervals for Population Mean	N 5.1, 5.3	
7	18	Confidence Intervals for Population Proportion	N 5.2	
7	19	Confidence Intervals for Difference between Means and Proportions	N 5.4 – 5.5	
7	20	Hypothesis Testing Fundamentals	N 6.1 – 6.2	HW4
8	21	Hypothesis Testing for Population Mean	N 6.1, 6.4	
8	22	Hypothesis Testing for Population Proportion	N 6.3	
8	23	Hypothesis Testing for Difference between Means and Proportions	N 6.5-6.6	HW5
9	24	The Chi-Square Test	N 6.10	
9	25	The F-test for equality of Variance	N 6.11	
9	26	Power	N 6.13	HW6
10	27	*Hypothesis Testing in Excel*		
10	28	Review for Midterm Exam 2		
10	29	**MIDTERM EXAM 2**		

Week	Class	Topic	Reference Sections	Due
11	30	Correlation	N 7.1	
11	31	Linear Regression	N 7.2	
11	32	Linear Regression: Uncertainties in Least Square Coefficients	N 7.3	
12	33	Linear Regression: Checking Assumptions and Transforming Data	N 7.4	HW7
12	34	Multiple Linear Regression	N 8.1	
12	35	Multiple Linear Regression: Confounding and Collinearity	N 8.2	
13		Thanksgiving Break - No Class		
13		Thanksgiving Break - No Class		
13		Thanksgiving Break - No Class		
14	36	Model Selection	N 8.3	HW8
14	37	*Correlation and Regression in Excel*		
14	38	*Correlation and Regression in Excel*		
15	39	Review for Midterm Exam 3		HW9
15	40	**MIDTERM EXAM 3**		
15	41	**Review for FINAL EXAM**		

****FINAL EXAM – Covers Entire Course (DEC 14, CAST 212, 3:30 – 5:30 PM)****