

## CE 3251: Engineering Applications for Probability and Statistics

MWF 2:30 – 3:20 Castleman Room 212

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### **Communication:**

When using email to communicate with your TA, UTA or Instructor, put CE3251 in the subject of the email.

Emails sent during normal business hours (8am-5pm M-F) will receive a response the same or the following business day. There may be a delay in response from your instructor to emails sent outside of normal business hours (before 8am or after 5pm M-F or on weekends).

Do not use HuskyCT to communicate with your instructor or TA.

### **Course Prerequisite:**

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

### **Course Objective:**

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. Estimate relationships between dependent and independent variables and interpret results

### **Textbook:**

Navidi, W. Statistics for Engineers and Scientists, 4th Edition, McGraw-Hill. A copy is on reserve in the library. In addition, the UCONN Bookstore has new and used copies: <https://tinyurl.com/8207-F19-CE-3251-001>

### **Other course materials:**

We use HuskyCT a lot in this class. All course materials (pdf of lecture slides, video lectures, homework assignments, quizzes, etc.) can be found on HuskyCT. The syllabus and course schedule indicate when information will be available. If you have questions or can't find something, please let your instructor know!

## Course Format:

This is a hybrid/blended course. This design takes advantage of new ways of teaching and today's technology to enhance student learning. Course content is delivered via:

- 1) in-class lectures and activities – typically meet in class Mondays and Fridays
- 2) online video lectures – typically on Wednesdays.

## Grading:

Your grade in the course will be based on homework and one exam as follows:

Component	Weight
Homework	4%
Exam	23%
<b>Total</b>	<b>27%</b>

## Homework:

- Homework is essential for practicing statistics! You will get credit for effort, completeness, and correctness.
- **To earn credit you must:**
  - Write your name on your homework!
  - Identify each problem clearly
  - Solve each problem in the order they were assigned
  - Write neatly; if your work is illegible, unclear or difficult to read, you will get a zero!
  - Include, when appropriate, graphs, tables, etc.
  - Submit homework via Husky CT by the due date. Due dates are listed in the syllabus course schedule.
- **You will get a ZERO if:**
  - You copy someone's homework, copy from CHEGG, or otherwise cheat. See *Academic Integrity*.
  - We can't read your work (See above)
  - You submit your homework late or forget to submit your homework.
- **No homework make-up. No exceptions.**

## Exams

- There will be one exam covering chapters 7 and 8 materials (see Class Schedule section below). Contact your instructor to arrange a time for this exam. One option is to take the exam during the final exam for CE2251.
- No makeup exam will be offered without prior arrangement with the instructor.

## Class Conduct

- This course is fast-paced and cumulative! Keep current with the course content—do not fall behind or if you do, catch up quickly!
- Attend classes, view the online course content, prepare for class, participate in classroom exercises and discussions, and **ask questions! Please do not be shy!!**
- Disruptive or disrespectful behavior of any kind will not be tolerated. Any disruptive or disrespectful behavior will be reported to the Assistant Dean for Undergraduate Education for further disciplinary action.
- Use of personal electronic devices including computers, cellphones and tablets in class for purposes not related to the class is distracting to you and your colleagues. Research shows

that use of personal electronic devices for non-academic purposes during class LOWERS your grade (Carter et al. 2016; Duncan et al. 2012; Ravissa et al. 2017)!

### **Academic Integrity**

Students will be held to the standards laid out in the *The Student Code* --

<https://community.uconn.edu/wp-content/uploads/sites/523/2016/06/1819-The-Student-Code.pdf>

### **Students with Disabilities**

Students with disabilities who believe they may need accommodations in this class are encouraged to contact the Center for Students with Disabilities located in Wilbur Cross, Room 204 as soon as possible to better ensure that such accommodations are implemented in a timely fashion. Staff can be reached by phone: 860-486-2020, Video Phone: 860-553-3243 or email: [csd@uconn.edu](mailto:csd@uconn.edu) or via the Contact Us page on their website, [csd.uconn.edu](http://csd.uconn.edu).

In addition to contacting CSD, please do not hesitate to talk with the course instructor so he/she may work together with CSD to implement accommodations.

### **Class Schedule**

The class schedule is printed on the following pages. CE3251 students are responsible for weeks 12-15 of the course. This includes Chapters 7 and 8 material, two homeworks (#9 and #10), and one exam (see Exam section above).

## Class Schedule

### Abbreviations

L = **in-class** Lecture

V = **on-line** Video lecture (Husky CT)

R/P = Review & Practice

QUIZ = **online** Quiz (HuskyCT)

HW = Homework (assignment and submission HuskyCT)

Week	Class	Date	Topic	Textbook Section(s)	HW Open	HW Due Date
1	1	8/26	L: Introduce course & review syllabus & HuskyCT L: Sampling & Summary Statistics Intro	1.1 - 1.2	HW#1 (1.1-1.3)	
1	2	8/28	V: Summary Statistics V: Graphical Summaries	1.2 - 1.3		
1	3	8/30	<i>No Class</i>			
2		9/2	<i>Labor Day - No Class</i>			
2	4	9/4	V: Probability: Basic Ideas & Counting Methods	2.1 - 2.2	HW#2 (2.1-2.5)	
2	5	9/6	L: Conditional Probability & Independence	2.3		HW #1 DUE
3	6	9/9	L: Random Variables	2.4		
3	7	9/11	V: Continuous Random Variables V: Linear Combination of Random Variables	2.5		
3	8	9/13	L: Propagation of Error	3.1-3.2	HW#3 (3.1-3.2, 4.1-4.3)	HW#2 DUE
4	9	9/16	L: Intro Discrete Distributions and Bernoulli Distribution	4.1		
4	10	9/18	V: Binomial Distribution	4.2		
4	11	9/20	L: Poisson Distribution	4.3		
5	12	9/23	R/P: Review for exam & practice			HW#3 DUE
<b>5</b>	<b>13</b>	<b>9/25</b>	<b>EXAM 1 (Ch. 1 - 4.3)</b>			
5	14	9/27	L: Intro Continuous Distributions and Normal Distribution	4.5	HW#4 (4.5-4.9)	
6	15	9/30	L: Lognormal & Exponential	4.6 - 4.7		
6	16	10/2	V: Principles of Point Estimation	4.9		
6	17	10/4	L: Central Limit Theorem	4.11		HW#4 DUE
7	18	10/7	L: Intro Confidence Intervals and Confidence Interval for Population Mean	5.1	HW#5 (4.11-5.5)	
7	19	10/9	V: Confidence Intervals for Population Proportion V: The Student's T-distribution	5.2 - 5.3		
7	20	10/11	L: Small-sample Confidence Intervals for Population Mean	5.3		

Week	Class	Date	Topic	Textbook Section(s)	HW Open	HW Due Date
8	21	10/14	L: Confidence Intervals for Difference between Means and Proportions	5.4-5.5		
8	22	10/16	R/P: Review for exam & practice			HW#5 DUE
<b>8</b>	<b>23</b>	<b>10/18</b>	<b>EXAM 2 (N: Ch. 4.5-5.5)</b>			
9	24	10/21	L: Hypothesis Testing Fundamentals & Population Mean	6.1 - 6.2	HW#6 (6.1-6.4)	
9	25	10/23	V: Hypothesis Testing for Population Proportion V: Small Sample Hypothesis Testing Population Mean	6.3 - 6.4		
9	26	10/25	L: Hypothesis Testing - Difference btwn Means	6.5	HW#7 (6.5 - 6.7)	HW#6 DUE
10	27	10/28	L: Hypothesis Testing - Difference btwn Proportions	6.6		
10	28	10/30	V: Small-sample Hypothesis Testing - Difference btwn Means	6.7		
10	29	11/1	R/P: Review & practice Hypothesis Testing			HW#7 DUE
11	30	11/4	L: Hypothesis Testing - Paired Data	6.8	HW#8 (6.8, 6.10, 6.11)	
11	31	11/6	V: F-test for equality of Variance V: Chi-Square Test	6.10, 6.11		
11	32	11/8	R/P: Review for exam & practice			HW#8 DUE
<b>12</b>	<b>33</b>	<b>11/11</b>	<b>EXAM 3 (N: Ch. 6.1-6.11)</b>			
12	34	11/13	V: Correlation	7.1	HW#9 (7.1-7.4)	
12	35	11/15	L: Intro Linear Regression L: Uncertainties in Least Square Coefficients	7.2-7.3		
13	36	11/18	L: Confidence Interval for Slope, Confidence vs. Prediction	7.3		
13	37	11/20	V: Checking Assumptions and Transforming Data	7.4		
13	38	11/22	L: Multiple Linear Regression	8.1	HW#10 (8.1-8.3)	HW#9 DUE
14		11/25-29	Thanksgiving Break - No Class			
15	39	12/2	L: Multiple Linear Regression: Confounding & Collinearity	8.2		
15	40	12/4	L: Model Selection	8.3		
15	41	12/6	R/P: Review for final exam & practice			HW#10 DUE
		<b>TBD</b>	<b>**FINAL EXAM - Cumulative</b>			