

University of Connecticut
CE 2210/ENVE 2330: Decision Analysis in Civil & Environmental Engineering
Fall 2009 Course Syllabus

Class meets: CAST 212 MWF 2:00-2:50 PM

Instructor: Nicholas E. Lownes, Ph.D.
Assistant Professor
Department of Civil and Environmental Engineering
Office: CAST 331
Email: nlownes@engr.uconn.edu
Phone: (860) 486-2717

Office hours: MWF 3:00 - 4:00 & by appointment

Teaching assistants: Thomas Gionet Email: thomas.gionet@uconn.edu
(203) 871-9960 Optional Recitation: Thur. 6:00 – 7:15, CAST 206
Joel Szarkowicz Email: joelszark@sbcglobal.net
(860) 630-0298 Office hours: Tu & Th, 1:00 – 3:00 PM in CAST 210
Stephen Prusaczyk Email: sprusaczyk81@gmail.com
(860) 486-0676 Office hours: Tu, 5:00 – 7:00 PM in BRON 310

Chi Epsilon Tutoring Hours: Tu & Th, 5:30 – 7:00 (tentative)

Website (HuskyCT): <<http://huskyct.uconn.edu/webct/entryPageIns.dowebct>>

Course Description: This course aggregates decision making tools from several disciplines including economics, probability and statistics in the context of engineering decision analysis. Topics to be covered include: time value of money, evaluation of alternative projects, fundamentals of probability theory and statistics, hypothesis testing, linear and multiple regression.

Course Objective: The objective of the course is for students to learn the fundamentals of engineering economics, probability and statistics and their application in engineering analysis and decision-making.

Course Outcomes: Students successfully completing the course will be able to:

1. Apply the principles of interest and time value of money in evaluating cash flow profiles.
2. Compare competing engineering alternatives using engineering economic principles.
3. Quantitatively describe data relationships and variability.
4. Select the appropriate analysis tool for a given experiment.
5. Use statistical tools to form and test hypotheses and estimate relationships among variables.
6. Correctly interpret the results of statistical analysis.

Required Text: The required text for this course is a custom text book by McGraw-Hill Primis (ISBN 0-39-092737 available at the CO-OP) comprised of chapters from two books. The book bears the same name as this course.

Only the required text is necessary, however, I've provided the references for the two texts that are condensed in the custom book in case students wish to purchase their texts outside of the CO-OP.

Blank, L. and A. Tarquin. *Basics of Engineering Economy*, McGraw-Hill, 2008.

Navidi, W. *Statistics for Engineers and Scientists*, 2nd Edition, McGraw-Hill, 2008.

Other materials (extra readings, homework assignments and solutions) will be distributed on HuskyCT.

Communications: HuskyCT will be the center for communications for this course. Please check your email and the message board at HuskyCT regularly (at least every other day), as I will occasionally post announcements. Please send non-emergency email related to the course through HuskyCT.

Elements of course and contribution to final grade:

In-class quizzes 5%	In-class quizzes will be given many class periods and will consist of a single question relevant to the day's lecture or a topic of general importance. Students will receive full credit for attempting the quiz and submitting it with their first and last names. Students will receive zero credit if they do not attempt the quiz. Quizzes cannot be made up at a later or earlier date.
Homework 25 %	Homework will be assigned and collected in 10 sets on the dates indicated on the syllabus. <u>No late homework will be accepted.</u> Homework will be posted on HuskyCT. It is expected that homework is printed <u>neatly</u> or typed. Illegible homework will be considered incomplete. For each homework problem the student will receive ½ credit for attempting the problem and showing their work and ½ credit for arriving at the correct answer. Solutions will be discussed in class. <i>Note:</i> Attempting the problem includes summarizing or paraphrasing the original problem, organizing the solution properly, and showing the steps to arrive at the solution.
Mid-term Exams 40 %	There will be two mid-term examinations; each counts as 20% of the final grade.
Final Exam 30 %	The Final Exam is tentatively scheduled for December 14, 2009, 3:30 – 5:30 PM Check the website for a final date and time as we near final exam week.

UConn Final Exam Policy: Final exam week for Fall 2009 takes place from Monday, December 14, through Saturday, December 19. Students are required to be available for their exam during that time. Students must visit the Dean of Students Office if they cannot make their exam. The DOS will give the student his or her instructions thereafter.

Please note: vacations, previously purchased tickets or reservations, weddings (unless part of the wedding party), and other large or small scale social events, are not viable excuses for missing a final exam. Please contact the Dean of Students office with any questions. Thank you in advance for your cooperation.

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%

Class Schedule

Note: B-T = Blank & Tarquin, N = Navidi

CLASS	DATE	TOPIC	TEXT SECTION	Primis PAGES
1	Aug. 31	Introduction / Foundations of Engr. Economy	B-T Ch. 1	1 - 23
2	Sep. 2	Simple & compound interest/ Cash Flow Diagrams	B-T Ch. 1	1 - 23
3	Sep. 4	Nominal & Effective Interest / Present & future worth of single payments, HW 1 Assigned	B-T 2.1	29 - 33
	Sep. 7	LABOR DAY – NO CLASS		
4	Sep. 9	Present and future worth of series of payments	B-T 2.2	34 - 37
5	Sep. 11	Present and future worth of gradient / Shifted Series and Gradients, HW 1 Due / HW 2 Assigned	B-T 2.3 – 2.4	37 - 45
6	Sep. 14	Equivalence	B-T 3.1 – 3.4	61 - 67
7	Sep. 16	Equivalence / Present Worth method intro	B-T 3.4 – 3.6	68 - 73
8	Sep. 18	Present worth method for alternative selection, HW 2 Due / HW 3 Assigned	B-T Ch. 4	81 - 96
9	Sep. 21	Annual net worth method for alternative selection	B-T Ch. 5	109 -118
10	Sep. 23	Rate of Return method for alternative selection	B-T 6.1 – 6.5	126 - 139
11	Sep. 25	Sampling & Descriptive Statistics, HW 3 Due/ HW 4 Assigned	N 1.1 – 1.3	197 - 234
12	Sep. 28	Probability: Basic Ideas & Counting Methods	N 2.1 – 2.2	244 - 264
13	Sep. 30	Conditional Probability & Independence	N 2.3	265 - 280
14	Oct. 2	Random Variables, HW 4 Due / HW 5 Assigned	N 2.4	285 - 306
15	Oct. 5	Linear Functions of Random Variables	N 2.5	311 - 319
16	Oct. 7	Propagation of Error	N 3.1 – 3.2	359 - 372
17	Oct 9	Review for Exam 1, HW 5 Due		
18	Oct. 12	EXAM 1 (B-T: Ch. 1 – 6, N: Ch. 1-3)		
19	Oct. 14	Probability & Statistics in practice†		
20	Oct. 16	Video: TBD		
21	Oct. 19	Bernoulli & Binomial Distributions	N 4.1 – 4.2	395 - 407
22	Oct. 21	Poisson Distribution	N 4.3	410 - 422
23	Oct. 23	Normal Distribution, HW 6 Assigned	N 4.5	436 - 447
24	Oct. 26	Lognormal & Exponential Distributions	N 4.6 - 4.7	451 - 465
25	Oct. 28	The Central Limit Theorem	N 4.11	485 - 494
26	Oct. 30	Confidence Intervals, HW 6 Due / HW 7 Assigned	N 5.1	518 - 531
27	Nov. 2	Confidence Intervals	N 5.2 – 5.3	534 - 548
28	Nov. 4	Hypothesis Testing Fundamentals	N 6.1 – 6.2	587 - 601
29	Nov. 6	Hypothesis Testing for population mean, HW 7 Due / HW 8 Assigned	N 6.1, 6.3 – 6.4	604 - 612
30	Nov. 9	Hypothesis testing comparing two means	N 6.5 – 6.7	614 - 632
31	Nov. 11	The F-test for equality of Variance	N 6.11	660 - 663
32	Nov. 13	The Chi-Square Test, HW 8 Due / HW 9 Assigned	N 6.10	650 -656

33	Nov. 16	Correlation / Power	N 7.1 / 6.13	696 – 710 / 670 - 676
34	Nov. 18	Review for Exam 2, HW 9 Due		
35	Nov. 20	EXAM 2 (N: Ch. 4 – 7.1)		
	Nov. 23	THANKSGIVING RECESS - NO CLASS		
	Nov. 15	THANKSGIVING RECESS - NO CLASS		
	Nov. 27	THANKSGIVING RECESS - NO CLASS		
36	Nov. 30	Linear Regression	N 7.2	713 - 725
37	Dec. 2	Linear Regression	N 7.3	729 - 744
38	Dec. 4	Multiple Regression, HW 10 Assigned	N 8.1	781 - 791
39	Dec. 7	Multiple Regression	N 8.2	799 - 804
40	Dec. 9	Logistic Regression	Handout	Handout
41	Dec. 11	Review for FINAL, HW 10 Due		
	Dec. 14*	FINAL EXAM – Cumulative (3:30 – 5:30 PM*)		

† Guest Lecturer: Dr. John Ivan

*Preliminary Date & Time