ECE 3530/CS 3130: Eng Probability and Statistics

Spring 2013

- **Lectures:** MWF 9:40 AM - 10:30 AM, WEB L103
- **Instructor:** Tolga Tasdizen
  - Email: tolga@sci.utah.edu
  - Office: WEB 3887
  - Office Hours: Mondays 10:30 AM-12:00 PM and Tuesdays 11 AM-12 PM and 2 PM-3 PM
    If you can't make these times, you may schedule a meeting by email.
- **TAs:** TBA
  - Study section: TBA
- **Required Text:** Probability & Statistics for Engineers and Scientists, 8th Edition
  - Authors: Walpole, Myers, Myers and Ye
  - Publisher: Prentice Hall, Upper Saddle River, NJ 07458
  - ISBN: 0-13-187711-9
- **Prerequisite:** MATH 1220 (Calculus II)
- **Course outcomes:** At the conclusion of ECE 3530 students should:
  - Understand basic concepts in probability including combinatorics, independence, conditional probability and Bayes rule.
  - Solve basic problems arising in engineering that involve discrete and continuos probability distributions.
  - Use statistical concepts such as means, variances and various types of graphs to analyze datasets using computational software such as MATLAB.
  - Understand confidence intervals and perform statistical inference such as hypothesis testing and regression.
- **Grading:**
  - Distribution of points:

9 homeworks	25%
2 midterms	$2 \times 25\%$
Final exam	25%

  - Final grades will be determined based on the average performance of the class; however, you are guaranteed the following grades: 93% = A and 90% = A-. The % required for A and A- may be lowered (but not raised) at the instructor's discretion.

- **Exams:**
  - Please make sure you have no conflicts with the exam dates shown in the weekly chart at the end of this syllabus. Make up exams will be administered only for exceptional circumstances. If you find out you will miss an exam, let the instructor know as soon as possible.
  - Exams will be closed book. You will be allowed 1 page of notes (front and back) but it must be handwritten (no photocopying, shrinking, etc.). Calculators can be used but no laptops allowed.
  - The final exam will not be comprehensive, it will focus on the last third of the course material. However, all exams can include relevant material from the previous parts of the course but this will not exceed 25% of the exam.
  - In all exams, you will be responsible for ALL material covered in class and required readings. Please do NOT study for the exams only from the homework questions.
- **Homeworks:**
  - Homeworks will be handed out in class and will also be available on the webpage.
  - Homework due date schedule can be found in the chart included with this syllabus.
  - Turn in to locker on 3rd floor of MEB near southeast stairway by 5 pm on due date. Do NOT bring your homework to class to give to the instructor. Make sure to drop your homework in the correct locker. The instructor and the TA will not be responsible for tracking down misplaced homeworks.
  - We will drop the lowest homework score from grading. This means you can miss 1 homework and not be penalized for it. No late homework will be accepted unless permission is granted by the instructor PRIOR to the deadline.
  - Graded homeworks can be picked up from the student mailboxes across the hall from the ECE office. Students need to have signed a sheet with the ECE office (they will place a green tag next to your mailbox when you do this) to allow us to place your homeworks there. If you are a non-ECE student or don't have a green tag next to your ECE mailbox, they can be picked up from the TA during her study section hours.
  - Some assignments will involve computational questions to be solved with MATLAB. These will generally include working with datasets to make statistical computations such as computing means, variances, etc. Students should have basic proficiency with MATLAB.
- **Course topics:** You will find a chart included in this syllabus that summarizes the weekly topics and required readings from the textbook. While we will strive to stay on track with this schedule, students should be aware that we might go slightly faster or fall behind depending on circumstances. We might make some minor changes to the course topics during the semester. We will post more updated required textbook readings on the class web site. It is strongly suggested that you read the material from the textbook prior to the lecture to be better prepared.

- **Course web site:** http://www.ece.utah.edu/∼ece3530/
  - I will post my notes on the webpage, but not everything I write on the board or talk about is guaranteed to be in the posted notes.
  - Textbook reading assignments to accompany the lectures will be regularly posted on the website.
  - Homeworks will be made available on the website on the day they are handed out in class.
  - Homework solutions will also be made available on the website after the due date.
- **Email:**
  - Occasionally, I might send important notices to the entire class such as corrections to assignment problems via email using the CIS class mailer. This email goes to your utah.edu address by default. Make sure you receive and regularly (daily) read email from this address or have it forwarded to an address that you read.
  - If you email me, I will strive to answer it in a timely manner (within 24 hours not including holidays and weekends). However, please do not expect a reply within the next hour. While I might sometimes reply that fast, there is no guarantee.
- **Cheating Policy:** Students are expected to pursue the highest standards of academic honesty in all assignments and examinations. Don't cheat! The following rules apply to this class:
  - Copying someone else's work on an exam is considered cheating. Don't pass any papers to anyone for any reason during the exam. Do NOT sit near your study partners during the exam.
  - Copying someone else's work on a homework is considered cheating. Copying from a webpage or other source without giving a reference is considered plagiarism which is a form of cheating. You are encouraged to discuss homework problems with each other, but the written work you turn in must be original and your own.
- **Equal Access:** The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the instructor and to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD) to make arrangements for accommodations.

#	Date	Notice	Topics	Textbook
1	M Jan 7		Course info, applications	Chapters 1 & 2
2	W Jan 9		Sample space, events, unions, intersections	
3	F Jan 11	HW 1 out	Venn diagrams, partitions, total probability	
4	M Jan 14		Tree diagrams, counting, permutations	Chapter 2
5	W Jan 16		Permutations and combinations	
6	F Jan 18	HW 1 due/HW 2 out	Conditional probability and independence	Chapter 2
	M Jan 21	Holiday - MLK day		
7	W Jan 23		Multiplicative rules, spy game	
8	F Jan 25	HW 2 due/HW 3 out	Spy game analysis	
9	M Jan 28		Bayes Rule	Chapter 2
10	W Jan 30		Bayes Rule	
11	F Feb 1	HW 3 due	Monty Hall	
12	M Feb 4		Practice exam solution	
13	W Feb 6	**Midterm 1**		
14	F Feb 8		Introduction to random variables	Chapter 3
15	M Feb 11		Random variables - expectation	Chapter 4
16	W Feb 13	HW 4 out	Random variables - variance	
17	F Feb 15		Discrete: Uniform and Binomial dist	Chapters 5 & 6
	M Feb 18	Holiday - Pres. Day		
18	W Feb 20		Continuous: Uniform and Normal pdf	
19	F Feb 22	HW 4 due/HW 5 out	Normal, Lognormal and exponential pdf	
20	M Feb 25		Joint and marginal distributions	Chapter 3
21	W Feb 27		Conditional distributions	
22	F Mar 1	HW 5 due/HW 6 out	Independent random variables	
23	M Mar 4		Covariance and correlation	Chapter 4
24	W Mar 6		Linear combinations of random variables	
25	F Mar 8	HW 6 due	Linear combinations	
	M Mar 11	Spring break		
	W Mar 13	Spring break		
	F Mar 15	Spring break		
26	M Mar 18		Chebyshev's Theorem, Multivariate Gaussian	
27	W Mar 20		Practice exam solution	
28	F Mar 22	**Midterm 2**		
29	M Mar 25		Introduction to statistics, data plots	Chapter 8
30	W Mar 27		Quantile plots, Central limit theorem	
31	F Mar 29	HW 7 out	Central limit theorem examples	
32	M Apr 1		Sampling distribution of S^2, t-distribution	Chapters 8 & 9
33	W Apr 3		Point estimation, confidence intervals	
34	F Apr 5	HW 7 due/HW 8 out	Confidence intervals: one sample mean	
35	M Apr 8		Confidence intervals: difference of means, S^2	Chapters 9 & 10
36	W Apr 10		Hypothesis testing	
37	F Apr 12	HW 8 due/HW 9 out	Hypothesis testing	
38	M Apr 15		Hypothesis testing	Chapters 10 & 11
39	W Apr 17		Linear regression	
40	F Apr 19	HW 9 due	Linear regression	
41	M Apr 22		Advanced topics	
42	W Apr 24		Practice exam solutions	
	Wed May 1	**Final exam**	In regular classroom 8-9 am	