Statistics 3470
Introduction to Probability and Statistics for Engineers
Spring 2016 Syllabus

Class Schedule: MWF 4:10-5:05pm McPherson Lab 1000

Instructor: Dr. Judit Bach
Office: CH 229 (Cockins Hall)
Office Hours: M: 12:40-1:30pm, Tu: 12:30-1:30pm
W: 9:00-10:00am, Th: 10:20-11:15am

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Course Description: The course provides an introduction to probability and statistics targeted toward students in several engineering disciplines. Topics covered include probability, discrete and continuous random variables, probability distributions, expected values, sampling distributions, point estimation, confidence intervals, hypothesis testing and simple linear regression models. A more detailed list of topics can be found in the tentative schedule below. **Students are responsible for all material covered in class, in the assigned readings and in homework problems, and expected to attend all classes.**

Assumed Background Knowledge and Prerequisites
Calculus, integration, exponential function, finite and infinite sums, union and intersection of sets. Prerequisite courses are Math 1152, 1161.xx, 1172, 1181H, 153, or 254.

Enrollment
ADD and SECTION CHANGES will be processed (if space is available) starting at 7:00 AM on Tuesday, January 19th on a first-come, first-served basis in room 408A Cockins Hall. Cockins Hall opens by 6am. The instructor does not sign any add or section change forms; these must be taken to 408A Cockins Hall for a signature.

Textbook
Probability and Statistics for Engineering and the Sciences (**9th edition**), by Jay Devore with **WebAssign** access. Alternatively, I am told the ebook and WebAssign access can be purchased through the OSU WebAssign access. A paper copy of the book is also available on reserve in the Science and Engineering Library as well as at the Mathematics & Statistics Learning Center (MSLC).

Format of Instruction
Lecture, 3 contact hours per week.

College of Arts and Sciences GEC Statement:
Statistics 3470 satisfies the General Education (GE) requirement in Data Analysis.
Goals*:* Students develop skills in drawing conclusions and critically evaluating results based on data.
Expected Learning Outcomes*:* Students understand basic concepts of statistics and probability, comprehend methods needed to analyze and critically evaluate statistical arguments, and recognize the importance of statistical ideas.
Methods*:* The focus of this course includes understanding of theoretical concepts, as well as problem solving applications of probability models and statistical inference. Examples include sampling, computing confidence intervals, hypothesis testing, and statistical modeling using regression.

Homework: There are 11 online homework assignments tentatively scheduled throughout the semester. They are specified and need to be turned in online through Webassign. There will be turn-in for grade homework sets as well as suggested homework sets for additional practice. The due dates are listed in the tentative daily schedule below and are also specified on Webassign. Instead of dropping the lowest homework score, the following better option will be given: An overall 90% performance on the homework assignments will count as 100% performance for the weight of the homework portion of the final grade. (accordingly a 45% performance will count as a 50% for the homework portion etc.)

Exams

There are two exams during the semester and a final exam. The exams are closed book exams with about 5-7 essay questions (about 7-12 essay questions for the final exam) similar in style and difficulty level to the suggested and turn-in homework problems and to the lecture examples. For each exam, you will be permitted one sheet of 8.5" x 11" handwritten paper with formulas you find helpful. (both sides of the paper may be used). The final exam is on Monday, May 2 from 4:00-5:45pm. For the final exam, two sheets of 8.5" x 11" paper (same rules as above) may be brought. The final exam will be cumulative, with a slight emphasis on those topics covered after the second midterm. A calculator should also be brought to all exams (no cell phone calculators or PDAs).

Full credit for each exam problem can only be earned through showing your justification for or work on each problem. Answers without work will **not** receive full credit.

Grading

The final course grade will be based on:

Homework	20%
Exam 1 (Wednesday March 2nd)	25%
Exam 2 (Wednesday April 6th)	25%
Final Exam (Monday May 2nd)	30%
	100%

Percentage Grading Scale

93% A 90% A- 87% B+ 83% B 80% B- 77% C+ 73% C 70% C- 67% D+ 60% D

Study Rooms and Help Hours - MSLC (Mathematics and Statistics Learning Center)

Our TAs hold office hours in the Mathematics and Statistics Learning Center in Cockins Hall room 134 starting the second week of classes. More details are on the MSLC webpage at http://mslc.osu.edu

Academic Misconduct

Please help maintain an academic environment of mutual respect and fair treatment. You are expected to produce original and independent work on the exams. Although students are often encouraged to work or study together even on homework assignments, all students must finalize and submit their own work individually.

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term 'academic misconduct' includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct http://studentlife.osu.edu/csc/.

Communication Devices
Cell phones, PDAs and other communication devices must be either turned off or put on vibrate during class. Please refrain from texting during class as a courtesy to those sitting around you. All electronic devices other than a calculator must be shut off and put away during examinations.

E-mail Correspondence
In order to protect your privacy, all course e-mail correspondence must be done through a valid OSU name.nn account. If you have not activated your OSU email account, you can activate your account at https://acctmgt.service.ohio-state.edu/cgi-bin/KRB1EntryAdd.

Advice

1. A tentative lecture schedule is given in this syllabus. Please, give a first reading to scheduled text sections *before* the lecture that covers that material.
2. The course moves rather quickly. If you are having difficulty, please get help as soon as possible.
Homework assignments can be very difficult if you wait until the last minute before trying any problems.
3. It is important that you provide sufficient detail in writing up solutions to the problems for grading.
It is also important that your solutions be presented neatly in a clear, easy to read and follow format.
No credit will be given for work that is too sloppy or difficult to read.
4. The material becomes more complex as it moves along. The first exam material may feel easy compared to the second exam. Keep working along as the semester progresses.
5. If you have a re-grade request on an exam, the request needs to be written on a sheet of paper attached to your original paper, within one week of the date the paper was first returned to class. If you are absent the day a graded paper is first returned to the class, it is your responsibility to come to me to get it in less than a week if you want to have a re-grade option available to you.

Addressing Issues of Differing Abilities

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; **http://www.ods.ohio-state.edu/.**

Drop Date
The last day to drop the course without a ‘W' appearing on your record is Friday, February 5, 2016.
The last day to drop the course without petitioning is Friday, March 25, 2016

Receiving an `I' for the Course
You cannot receive an incomplete for the course unless 65% of the work in the course has been completed. Extenuating circumstances will be handled on a case-by-case basis.

Note
This syllabus and the schedules listed below **ARE SUBJECT TO CHANGE**.

Tentative Class Schedule and Reading assignments

Date	Topic	Section
M-Jan 11	Course Introduction; Sample Spaces and Events	2.1
W-Jan 13	Axioms and Properties of Probability	2.2
F-Jan 15	Counting Techniques	2.3
M-Jan 18	**No class---Dr. Martin Luther King, Jr. Day**	
W-Jan 20	Conditional Probability	2.4
F-Jan 22	Bayes' Theorem and Independence	2.5
M-Jan 25	Random Variables; Discrete Distributions	3.1, 3.2
W-Jan 27	Discrete Distributions; pmf, cdf	3.2
F-Jan 29	Expected Values	3.3 **Hw 1 & 2 due (2.1-5,3.1)**
M-Feb 1	Expected Values; Binomial Distribution	3.3, 3.4
W-Feb 3	Binomial Distribution; Poisson Distribution	3.4, 3.6
F- Feb 5	Probability Density Functions; cdf, Expected Values & Variances	4.1, 4.2 **Hw 3 due (3.2-3)**
M-Feb 8	Probability Density Functions; cdf, Expected Values & Variances	4.1, 4.2
W-Feb 10	Normal (Gaussian) distribution	4.3
F-Feb 12	Normal (Gaussian) distribution, Exponential and Gamma Distrs.	4.3, 4.4 **Hw 4 due (3.4,3.6,4.1)**
M-Feb 15	Exponential and Gamma Distributions	4.4
W-Feb 17	Jointly Distributed Random Variables	5.1
F-Feb 19	Jointly Distributed Random Variables, Expected Values	5.1, 5.2 **Hw 5 due (4.2-4)**
M-Feb 22	Expected Values, Covariance & Correlation, Sample Mean Distr.	5.2, 5.3
W-Feb 24	Distribution of the Sample Mean; Central Limit Theorem	5.3, 5.4
F-Feb 26	Central Limit Theorem, Distribution of a Linear Combination	5.4, 5.5 **Hw 6 due (5.1-4)**
M-Feb 29	General Concepts of Point Estimation	6.1
W-March 2	**EXAM 1**	**Ch. 2-5**
F-March 4	General Concepts of Point Estimation	6.1
M-Mar 7	Methods of Point Estimation	6.2
W-Mar 9	Methods of Point Estimation	6.2
F-Mar 11	Basic Properties of Confidence Intervals	7.1 **Hw 7 due (6.1-2)**
Mar 14-18	**No class-Spring Break**	
M-Mar 21	Confidence Intervals for a Population Mean	7.2
W-Mar 23	Confidence Intervals for a Population Mean and Proportion	7.2, 7.3
F-Mar 25	Confidence Intervals for a Population Mean and Proportion	7.2, 7.3 **Hw 8 due (7.1-2)**
M-Mar 28	Hypothesis and Test Procedures	8.1
W-Mar 30	Tests About a Population Mean	8.2
F-Apr 1	Tests About a Population Proportion	8.3, 8.4 **Hw 9 due (7.3,8.1-2)**
M-Apr 4	Tests About a Population Proportion	8.3, 8.4
W-Apr 6	**EXAM 2**	**Ch. 6-8**
F-Apr 8	Goodness-of-Fit Tests	14.1
M-Apr 11	Simple Linear Regression Model, Estimating Model Parameters	12.1, 12.2
W-Apr 13	Estimating Model Parameters; Inferences About the Slope	12.2, 12.3
F-Apr 15	Inferences About the Slope; Inferences About Estimates	12.3, 12.4 **Hw 10 due (8.3-4,14.1)**
M- Apr 18	Inferences About Estimates	12.4
W-Apr 20	Assessing Model Adequacy	13.1
F-Apr 22	Multiple Regression	13.4 **Hw 11 due (12.1-4)**
M- Apr 25	Multiple Regression	13.4
M-May 2	**Monday 4:00-5:45pm Final Exam**	**Cumulative**

The online homework due dates are on Fridays.