STAT3450 – 2 CREDIT HOURS
Basic Statistics for Engineers

Term: Spring, 2016
Instructor: Matthew T. Pratola
Email: mpratola@stat.osu.edu
Location: TuTh 4:10-5:05pm Scott Lab E001
Office Hours: Tuesdays 11:10-12:10 CH204D
Course Website: Carmen
Long course title: Basic Statistics for Engineers

Course description:
STAT3450 provides an introduction to probability and statistics targeted toward students studying mechanical engineering. Topics covered include probability, random variables, the normal and binomial distributions, confidence intervals for means, hypothesis tests for means, multi-factor experiments and experiments with blocking.

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.

STAT 3450 helps students achieve these ELOs by teaching students the basic concepts and techniques of statistics, including populations and samples, probability, expectations and variances, the binomial and Normal distribution, the Central Limit Theorem, confidence intervals and hypothesis testing, type I and II errors and power, experiments and numerical summaries and graphical summaries of data.

Course Prerequisites:
Calculus, integration, exponential function, finite and infinite sums, union and intersection of sets. Prerequisite courses are Math 1152 (153), 1161.xx, 1172 (254), or 1181.

Textbooks:

- *Principles of Statistics for Engineers and Scientists* by William Navidi. The book is available on reserve in the 18th Avenue Library.

Course Requirements:
Students are responsible for all material covered in class, in the assigned readings and in homework problems. As an introductory course, the quantity of material covered in the lectures is extensive. It is highly recommended that you do not fall behind.

Assignments:
You are encouraged to discuss problems with each other in general terms, but you must write your own homework solutions. Homework reports must be submitted in hardcopy. Late submissions will NOT be accepted. There will be approximately 10 graded homework assignments throughout the semester. The due dates for the assignments are shown below. The assignments and assignment solutions will be posted on Carmen. You must show your work for all homework problems; do NOT just write the final answer.

Due to the size of the class, we may not be able to grade each of the assigned problems in detail. In this case, we will select several of the assigned problems to grade and spot check the others to make sure you attempted a solution. It will be your responsibility to compare your answers for those questions that are not graded in detail with the solution set to see if you understand the material.

Homework will be collected at the start of class on the due date. **This is the only acceptable way to turn in homework** (do not leave homework assignments under my office door or email electronic copies). Late homework will NOT be accepted (no excuses). I understand that illness and other unplanned emergencies often come up during the semester, and so I will drop your two lowest homework scores. I highly recommend that you save these "freebies" until you really need to use them.

ACADEMIC MISCONDUCT OF ANY SORT WILL *NOT* BE TOLERATRED. Please review OSU's policies at http://studentaffairs.osu.edu/csc/.

Exams:
Two midterm exams will be given in class: the first is on Tuesday, February 9th and the second is on Thursday, March 10th. One 8.5" x 11" sheet of paper with whatever handwritten facts, formulas or explanations you find helpful may be brought to each midterm exam (both sides of the paper may be used). The date and time of the final exam is scheduled for Monday, May 2nd from 6:00PM-7:45PM in Scott Lab E001. Two 8.5" x 11" sheets of paper (same rules as above) may be brought to the final. The final exam will be cumulative, with a slight emphasis on those topics covered after the second midterm. A basic calculator will be necessary for all exams (no cell phone calculators or PDAs). Cellphones must be silenced during class and are not allowed to be on the desk or otherwise accessible during exams. No make-up exams will be given.

Dates:
Homework due dates and midterm dates are tentatively as follows (please refer to in-class announcements for official dates):
HW1 01/21; HW2 01/28; HW3 02/04
Midterm I 02/09 (in class);
HW4 02/18; HW5 02/25; HW6 03/03;
Midterm II 03/10 (in class);
HW7 03/29; HW8 04/05; HW9 04/12; HW10 04/19;
The last day to drop the course without a 'W' appearing on your record is Friday February 5th.

Grading:
The course marking scheme is: **20%HW, 25%Midterm 1, 25% Midterm 2, 30% Final**
Final course grades will be assigned based on the following grading scale:

	B+: 87-89	C+: 77-79	
A: 93-100	B: 83-86	C: 73-76	D: 60-69
A-: 90-92	B-: 80-82	C-:70-72	F: below 60

This grading scale is subject to adjustment if it appears necessary due to overall class performance. These adjustments will only raise a students grade, not lower it.

(Tentative) Schedule of Topics:

Class	Date	Section	Topic
1	12-Jan	1.1-1.3	Sampling, numerical and graphical summaries
2	14-Jan	3.1	Probability rules, equally likely outcomes
3	19-Jan	3.2	Conditional probability, independence
4	21-Jan	3.3	Discrete RVs, probability mass functions
5	26-Jan	3.3	Expeected values, variances
6	28-Jan	3.3	Continuous RVs, density and distribution fn's
7	2-Feb	3.3	Means and variances of continuous RVs
8	4-Feb	3.3	Random sample, sample mean, propagation of error
10	11-Feb	4.1	Binomial distribution
11	16-Feb	4.3	Normal distribution
12	18-Feb	4.3,4.7	Linear combo. of Normal RVs, plots
13	23-Feb	4.8	Central limit theorem
14	25-Feb	5.1-5.2	CI for mean
15	1-Mar	5.2	Sample size calculations
16	3-Mar	5.4	t-intervals
17	8-Mar	6.1	Hypothesis tests for pop'n means
19	22-Mar	6.2	Significance levels, p-values
20	24-Mar	6.4	t-tests, fixed-level testing
21	29-Mar	6.6	Type I and II errors
22	31-Mar	6.7	Power
23	5-Apr	7.1,7.3	2-sample t-tests
24	7-Apr	9.1	Experiments, randomization, F-tests, ANOVA
25	12-Apr	9.3	2-factor experiment, balanced vs unbalanced
26	14-Apr	9.4	Blocking
27	19-Apr	9.5	2^p factorial experiments
28	21-Apr	notes	Fractional factorial designs

Study Rooms and Help Hours: Our TAs hold office hours every day of the week in the Mathematics and Statistics Learning Center in Cockins Hall room 134 starting on Tuesday, January 19th. The hours during which Stat 3450 TAs will be available is posted at http://mslc.osu.edu/courses/stat/3450.

Academic Misconduct:

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/.

Special Accomodations:

Students with disabilities that have been certified by the Office for Disability Services will be approporiately 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 (or see http://www.ods.ohio-state.edu/).