Stat 3450 (12600) Basic Statistics for Engineers
Autumn 2018

Instructor: Jiae Kim
Office: JR 253A
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Office Hours: M 9-11 am CH122, R 4:10-6:10 pm JR 253A   Class Hours: T,R 8:00 - 8:55 am

Course Description

STAT 3450 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.

GE Data Analysis 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.

Textbook

Principles of Statistics for Engineers and Scientists by William Navidi

- This book is available on reserve in the 18th Avenue Library and Thompson Library.

Topics

We will be covering all or parts of chapters 1,3,4,5,6,7,9.

Website

The course website is carmen.osu.edu; please check it regularly. On the site you will find announcements, the syllabus, lecture notes, homework assignments, quizzes, solutions, and grades.

Lines of Communication

All correspondence must be using your OSU name.# address, otherwise we cannot respond. Please make sure to include "STAT 3450 (12600)" in the subject line. You can also contact the instructor through Carmen. Thanks for your cooperation!

MSLC - Mathematics and Statistics Learning Center

The Mathematics and Statistics Learning Center provides group tutoring in Cockins Hall 122 beginning August 27th. More information can be found at
http://mslc.osu.edu/courses/stat/3450.

Grading Policy

Your final grade will be based on the following weighting structure:

Component	Percentage
Homework	20%
Quiz	10%
Attendance	5%
Midterm 1	20%
Midterm 2	20%
Final	25%

Homework Assignments

There will be approximately 8 homework assignments throughout the semester. Assignments along with due dates is subject to change. All changes will be announced in class.

1. You are encouraged to discuss problems with each other in general terms, but you must write your own homework solutions.

2. Homework must be submitted in hardcopy (NO e-mailed copies).

3. You must show your work for all homework problems; do NOT just write the final answer.

4. Late submissions will NOT be accepted. I understand that illness and other unplanned emergencies often come up during the semester, and so I will drop one of your lowest homework score.

5. Homework will be collected at the start of class on the due date.

6. A subset of assigned problems will be graded for accuracy and the rest for completion. Solutions to all problems will be posted on the website, so it is your responsibility to check the solutions and make sure you understand them for all problems.

Quiz

Throughout the semester you will be given 6 online quizzes worth 10 points each. They will appear as Quiz on Carmen. You will have one hour from when you open the quiz to complete it. You may use any materials you want to complete the quiz. We encourage you to work on your own to get the most learning possible. Solutions will be provided after the due date/time has passed. They will be due on 9/9, 9/23, 10/7, 10/21, 10/28 and 12/2 at 11:59 pm of each day. You may also see dues on Carmen.

Attendance

1. You are expected to attend every class session.

2. Exceptions can be made under the university rule 3335-9-22 (B):
   When a student misses class in order to participate in a university sanctioned event, such as a field trip for another class, or an athletic or band event, or a specially scheduled class or examination scheduled in accordance with rule 3335-8-15 of the Administrative Code, it is the student's responsibility to present, at the earliest possible date, documentation of the required absence to each instructor whose class is to be missed. Documentation may include a copy of the course syllabus that shows the scheduled activity from a class scheduling an event or special session, or a memo from the instructor, coach, or person in authority requiring the absence. It shall be the responsibility of the instructor of the class or coordinator of the event causing the student to miss class to provide such documentation to the student. This documentation may be the basis of an excuse for an absence from class under the policies provided in rule 3335-9-21 of the Administrative Code.

3. It is also your responsibility to get any and all material covered from a classmate if you miss class. Arriving late or leaving early is distracting to your classmates, and me and will not be tolerated.

4. We will be using Top Hat to take attendance, starting from the second week of the semester. Make sure that you are enrolled in Top Hat course - Join code : 474644.

5. Each day, from 10 minutes prior to class, unique 4 digits of attendance code will appear at the bottom middle of lecture slides during class. You can check in anytime during class.

6. Details about Top Hat can be found at
   https://resourcecenter.odee.osu.edu/top-hat/using-top-hat-students

7. Missing more than 16 lectures (about 60%) will received 0 on attendance. Attendance will be graded based on the following scheme: (excluding excused absence)

Number of missed classes	1-4	5-8	9-12	12-16	> 16
Points	10	8	6	4	0

Exams

Two midterm exams will be given: the first is on Thurday, September 27 (in class), the second is on Tuesday, November 06 (in class). The final is on Tuesday, December 11 from 8:00-9:45 am.

1. You may bring one (for each midterm) or two (for the final) 8.5" × 11" sheet of paper(s) (both sides) with whatever handwritten facts, formulas or explanations you find helpful.

2. Cell phones must be silenced during exam and are not allowed to be on the desk or otherwise accessible during exams.

3. You must bring your Buck-ID, pencils (no pens please), and a scientific calculator (any type except one that can connect to the Internet) to each exam.

4. Exam questions are multiple choice, true/false, and short answer/work it out problems with interpretation. The amount of weight placed on the MC/TF vs the Short answer varies.

5. If you are late to an exam, had the wrong day on your schedule, or missed the exam for any unexcused reason, you might not be allowed to make it up and may receive a zero. Any missed exams with no communication to us (except for extreme emergencies) may receive a 0.

6. Make-up Exams: If you have an emergency and are going to miss an exam please notify the instructor as soon as possible so arrangements can be made. Please also have documentation (doctor's note, etc.) as to why you missed the exam. Your documentation must be approved prior to your being allowed to take a make-up exam. If you are allowed to take a make-up, you will receive a penalty of 20% of the total points possible on the exam.

7. No early final exams. Plan your schedule in advance, including the purchase of plane tickets, so you leave AFTER our final is over.

Final course grades will be assigned based on the standard grading scale:

A	A-	B+	B	B-	
$[93, 100]$	$[90, 93)$	$[87, 90)$	$[83, 87)$	$[80, 83)$	
C+	C	C-	D+	D	E
$[77, 80)$	$[73, 77)$	$[70, 73)$	$[67, 70)$	$[60, 67)$	$[0, 60)$

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 Accommodations

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Note

- If you have a personal issue that is confidential, requires special attention by the university, an unresolved issue, or would like a private discussion regarding your grade in the class, etc., contact Jiae Kim, the instructor at kim.3887@buckeyemail.osu.edu.

- Cell phones and all other electronic devices: Taking photos of anyone else's work at any time is considered academic misconduct and will be automatically submitted to the OSU Committee on Academic Misconduct.

Tentative Course Schedule

Lecture	Date	Section(s)	Topic	Other
1	08/21	1.1-1.3	Summarizing data	
2	08/23	1.3, 3.1	Summarizing data, Basic probability	
3	08/28	3.1-3.2	Conditional probability and independence	
4	08/30	3.2-3.3	Conditional probability, discrete RVs	HW1
5	09/04	3.3	Discrete RVs	
6	09/06	3.4	Continuous RVs	Quiz 1 (09/09)
7	09/11	3.4	Continuous RVs	HW2
8	09/13	3.4	Functions of RVs	
9	09/18	4.1	Binomial distribution	
10	09/20	4.3	Normal distribution	Quiz 2 (09/23)
11	09/25	4.3,4.7	Normal distribution, Probability plots	HW3
	09/27		Midterm 1 - in class	
12	10/02	4.8	Central Limit Theorem	
13	10/04	5.1,5.2	Point Estimation, Large-Sample CIs for μ	Quiz 3 (10/07)
14	10/09	5.2,5.4	Small-Sample CI for μ	HW4
	10/11		Autumn Break - no class	
15	10/16	5.4,6.1	Small-Sample CI for μ, hypothesis testing	
16	10/18	6.1	Z-tests	Quiz 4 (10/21)
17	10/23	6.2	Hypothesis test decisions and relationship to CIs	HW5
18	10/25	6.2,6.4,6.6	t-tests, fixed level testing	Quiz 5 (10/28)
19	10/30	6.6,6.7	Testing errors and power	
20	11/01	7.1	Two sample z-tests and CIs	HW6
	11/06		Midterm 2 - in class	
21	11/08	7.3,9.1	Two sample t-tests and CIs, one-factor experiments	
22	11/13	9.1	One-way ANOVA	
23	11/15	9.1,9.3	One-way ANOVA, two-factor experiments	
24	11/20	9.3	Two-way ANOVA	HW7
25	11/22	9.4	Thanksgiving Day - no class	
	11/27		Blocking	
26	11/29	9.5	2^p factorial experiments	Quiz 6 (12/02)
27	12/04		Final exam review	HW8
	12/11		Final 8:00am-9:45am	

I reserve the right to change the dates of any and all assessments. At least one week of notice will be provided in case of a change. Any changes will be announced in class!