

STAT 3450: Basic Statistics for Engineers

Spring 2017

Instructor: Justin Strait

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Office Hours: TBD in TBA

Lecture Time/Location: MW 4:10-5:05 in Eighteenth Avenue (EA) 170

Course Website: Canvas (access through <https://carmen.osu.edu/>)

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

- The book is available on reserve in the 18th Avenue Library.

Homework Assignments

There will be approximately 10 homework assignments throughout the semester. Assignments along with due dates will be announced in class and posted on Canvas.

Important things to know about homework:

- You are encouraged to discuss problems with each other in general terms, but you must write your own homework solutions.
- Homework must be submitted in hardcopy (NO e-mailed copies).
- You must show your work for all homework problems; do NOT just write the final answer.
- **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 your lowest homework score.
- I will select a subset of assigned problems to grade and check the others to make sure you attempted a solution. Solutions to all problems will be posted on Canvas, so it is your responsibility to check the solutions and make sure you understand them for all problems.
- Homework will be collected at the **start of class** on the due date. Once class starts, homework will not be accepted.

Exams

Three midterm exams will be given: the first is on **Monday, February 20 (in class)**, the second is on **Monday, March 27 (in class)**, and the third is on **Monday, May 1** from 4:00-5:45 pm.

Important things to know about exams:

- For each midterm, you may bring one 8.5” x 11” sheet of paper (both sides) with whatever handwritten facts, formulas or explanations you find helpful.
- A basic calculator will be necessary for all exams (no cell phone calculators or PDAs).
- Cell phones 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 unless extenuating circumstances exist.**

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

Component	Percentage
Homework	25%
Midterm 1	25%
Midterm 2	25%
Midterm 3	25%

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

A: 93-100; A-: 90-92; B+: 87-89; B: 83-86; B-: 80-82;
 C+: 77-79; C: 73-76; C-: 70-72; D: 60-69; 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 student’s grade, not lower it.

Tutor Room and Help Hours

Our TAs hold office hours every day of the week in the Mathematics and Statistics Learning Center in Cockins Hall 134 starting on Tuesday, January 17. The hours during which Stat 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 Accommodations

Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614- 292-3307, slds@osu.edu.

Tentative Course Schedule

Date	Section(s) of Book	Topic
Jan 9	1.1-1.3	Summarizing data
Jan 11	3.1	Basic probability
Jan 16	NO CLASS	MLK Day
Jan 18	3.1-3.2	Conditional probability and independence
Jan 23	3.2-3.3	Conditional probability, discrete RVs
Jan 25	3.3	Discrete RVs
Jan 30	3.4	Continuous RVs
Feb 1	3.4	Continuous RVs
Feb 6	3.4	Functions of RVs
Feb 8	4.1	Binomial distribution
Feb 13	4.3	Normal distribution
Feb 15	4.3, 4.7	Normal distribution
Feb 20	MIDTERM 1	In class
Feb 22	4.8	Central Limit Theorem
Feb 27	5.1-5.2	Z-intervals
Mar 1	5.2, 5.4	Z-intervals, t-intervals
Mar 6	5.4, 6.1	t-intervals, hypothesis testing
Mar 8	6.1	Z-tests
Mar 13	NO CLASS	Spring Break!
Mar 15	NO CLASS	Spring Break!
Mar 20	6.2	Hypothesis test decisions and relationship to CIs
Mar 22	6.2, 6.4, 6.6	t-tests, fixed level testing
Mar 27	MIDTERM 2	In class
Mar 29	6.6-6.7	Testing errors and power
Apr 3	7.1	Two sample z-tests and CIs
Apr 5	7.3, 9.1	Two sample t-tests and CIs, one-factor experiments
Apr 10	9.1	One-way ANOVA
Apr 12	9.1, 9.3	One-way ANOVA, two-factor experiments
Apr 17	9.3	Two-way ANOVA
Apr 19	9.4	Blocking
Apr 24	9.5	2 ^p factorial experiments
May 1	MIDTERM 3	4:00 pm-5:45 pm

I reserve the right to change items on this syllabus – any changes as well as official due dates and exam dates will be announced in class!