SYLLABUS

Statistical Methods (stat 302), Spring 2018

Instructor: Dr. Lan Zhou
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Lectures:
TTh 11:10 – 12:25pm (Section 510) Blocker 150
TTh 2:20 – 3:35pm (Section 504) Blocker 169
Office hours: Tuesday 9-10am, Friday 10-11am

Main Topics: Statistics is the science of learning from data. This course focuses on understanding statistical concepts and applying them to real world problems. Topics covered include descriptive statistics, probability distribution, sampling distribution, data collection and statistical inference, estimation, confidence intervals and hypotheses testing, linear regression. The course is intended for students in biological sciences or agriculture (except agricultural economics).

Learning Objective: The main learning objective of the course is for students to be able to analyze and interpret data that is limited and variable to make conclusions about populations. To be specific, we are going to learn:

1. How to describe data, in particular, to choose different description methods for different data, and interpret statistical description of the data.
2. How to calculate the probability of an event, which can be as simple as getting a head when toss a coin, or as complicated as winning in an election.
3. How to collect a representative data sample, recognize different experimental designs and survey schemes.
4. How to make inference about the population based on the sample data and how to draw correct conclusion based on the inference results.

Prerequisites: Math 141, 166 or the equivalent high school algebra

Textbook (optional): **http://courses.bfwpub.com/psls2e.php**
The Practice of Statistics in the Life Sciences (PSLS) by Brigitte Baldi and David Moore

Course Website: https://ecampus.tamu.edu/
All course materials, including lecture notes, practice exams and answer keys, scores, etc. will be posted on eCampus; all course related questions should be posted on eCampus discussion board.

Homework Website: https://www.webassign.net/tamu/login.html

Software: JMP. Instructions for obtaining JMP will be posted on eCampus.

On a number of occasions you will be required to use JMP to complete the homework assignments.

Help sessions:

Tuesday 12:30 – 1:30pm, Thursday 4-5pm, Blocker 405 A/B (TA: David C Whiting)
Monday, Wednesday 10:15 – 12:15pm, 1:45-3:45pm, 5 – 7pm; Tuesday, Thursday 10:15 – 12:15pm, 2-4pm, 5 – 7pm, Blocker 162 (Stat graduate students)

Required Materials:

1. A calculator that has a square root function and can do calculations to at least 6 decimal places.
2. Three large gray scantrons to be used in 3 major exams.
3. The course notes posted periodically on eCampus must be printed out and brought to each class.
4. One piece of paper, a pencil and a calculator for in-class quiz.

Exams: There will be two in-class midterms and one final exam. You will need an 8.5x11 GRAY scantron and your student ID for EACH exam. The exams are closed book (a 8.5x11 cheat sheet is allowed for each exam).

Exam schedule:

Midterm I: Thursday, Feb. 22, in class
Midterm II: Thursday, April 5, in class
Final Exam:
Section 504 – Tuesday, May 8, 1 – 3pm, Blocker 169
Section 510 – Thursday, May 3, 3 – 5pm, Blocker 150

Quizzes: Indefinite number of one-question quiz will be given and 20% of students will be randomly selected to turn in their answers. To compensate for university excused absences, the lowest quiz score will be dropped. At the end of the semester, your total quiz score towards the calculation of your grade will be the average of all your graded quiz scores after dropping your lowest quiz score. If a student has never been selected during the whole semester, full credit will be given. There will be no makeup quizzes.

Homework: Homework will typically be posted on Thursday and will be due the following Thursday night by 10pm. There will be tentatively 12 homework assignments. NO late homework will be accepted nor will you be allowed to make up missed homework. To compensate for university excused absences, the lowest homework score will be dropped.

Grading policy:

Homework 20%, quizzes 5%, midterms 20% each, final 35%.

Course grades are assigned by total scores using the following scale:

$90\% \le \text{score} \le 100\%$ => A

80% ≤ score < 90% => B
70% ≤ score < 80% => C
60% ≤ score < 70% => D
0% ≤ score < 60% => F

Change/Excuse on exams need be approved in advance, with official document proving stated reason. Exams missed due to emergency reasons need official justification afterwards; you need contact me within two days. Non-excusable missed exams receive a grade of zero; excusable ones will be replaced by makeup exams if taken within one week of the missed exams or be compensated by placing more weights on the other exams. If the final exam is missed but the student has finished other exams and the homework assignment, a temporary grade of I (Incomplete) is given.

University Excused Absences: Please refer to the Student Rules guidelines (see http://student-rules.tamu.edu/academicrules).

ADA (Americans with Disabilities Act) Statement: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

Statement on Sexual Harassment: Sexual harassment is a form of sex discrimination. Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when this conduct explicitly or implicitly affects an individual's employment, unreasonably interferes with an individual's work or educational performance, or creates an intimidating, hostile, or offensive work environment.

Plagiarism Statement: The handouts used in this course are copyrighted. By 'handouts', I mean all materials generated for this class, which include but are not limited to syllabi, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I explicitly grant permission. As commonly defined, plagiarism consists of the passing off as one's own ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have permission of that person. Plagiarism is one of the worst academic sins, for the plagiarism destroys the trust among colleagues without which research can not be safely communicated.

Academic Integrity Statement:
"An aggie does not lie, cheat, or steal or tolerate those who do."

Please refer to http://student-rules.tamu.edu/aggiecode.

Tentative schedule:

Week	Chapters	Content
1/18	1, 2	Syllabus, Topic 1: sample and population, variables
1/23 , 1/25	2, 9	Topic 1: Graphical tools in data description, mean and median, Variance and standard deviation, 5-number summary, IQR, boxplots
1/30 , 2/1	9,10	Topic 2: Events; probability, conditional probability, Tree diagrams, Bayes's Theorem
2/6 , 2/8	10, 11, 12	Finish Topic 2. Topic 3: Probability distributions; uniform distribution, normal distribution
2/13 , 2/15	12, 13	Topic 3: Binomial distribution. Topic 4: Sampling distribution of the mean
2/20 , 2/22	1,2,9,10,11,12	Review and Midterm I
2/27 , 3/1	13,14,15,17: Ignore hypothesis testing	Topic 4: Sampling distribution of the sample proportion. Topic 5: Point estimation, confidence intervals for population means
3/6 , 3/8	17,19; 14,15: hypothesis testing	Topic 5: Point estimation, confidence intervals for population proportions. Topic 6: Hypothesis testing, z-test
3/13 , 3/15		Spring break
3/20 , 3/22	14,15,17,19: hypothesis testing	Topic 6: Type I and II errors, power, t-test
3/27 , 3/29	7,8	Topic 7: Collecting data
4/3 , 4/5	7,8,13,14,15,17,19	Review and Midterm II
4/10 , 4/12	18,20	Topic 8: Inference about two samples
4/17 , 4/19	3,4,23	4/17 Q-drop. Topic 9: relationship between two quantitative variables; linear regression
4/24 , 4/26	22	Topic 10: hypothesis on categorical variables; chi-square tests