Statistics 305
Engineering Statistics

TR 02:10 - 03:30 PM, Atanasoff B0029

Course Description: *(Prereq: MATH 165)* Statistics for engineering problem solving. Principles of engineering data collection; descriptive statistics; elementary probability distributions; principles of experimentation; confidence intervals and significance tests; one-, two-, and multi-sample studies; regression analysis; use of statistical software.

Learning Outcome: By the end of this course, students should learn basic concepts of statistics and probability to solve problems arising in engineering applications.

Required Text: *Basic Engineering Data Collection and Analysis* by Stephen B. Vardeman and J. Marcus Jobe (ISBN 0-534-36957-X).

Instructor: Amin Shirazi (ashirazi@iastate.edu, 3220 Snedecor Hall, 1-515-294-7891).

Resources:

Office hours ..... T & R 03:30-04:30 PM in 3220 Snedecor Hall.
TA .... Huo, Yonghui (huoyh@iastate.edu, office hours: Wed 02:00- 03:00, Fri 09:00- 10:00, Snedecore Hall)
Course page ..... *https://ashirazist.github.io/stat305_s2020.github.io/index.html*
Canvas ..... For grades *https://canvas.iastate.edu*
Software ... JMP (free download at *https://www.stat.iastate.edu/statistical-software*

Class attendance: You are responsible for all material presented in lecture and assigned as required reading. No Class during March 16-20 (Spring break)
Grades do not directly depend on attendance - still, experience shows that attendance and course performance are significantly related to each other. In order to get the most out of this course and do his or her personal best, it is necessary for a student to treat attendance as if it were mandatory.

Important Dates:

Quiz 1 ..... February 6, Thursday
Quiz 2 ..... February 27, Thursday
Spring break ..... Monday - Friday, March 16-20
Quiz 3 ..... April 2, Thursday
Quiz 4 ..... April 23 , Thursday
Course Final ..... May 5, Tuesday 02:15- 04:15., location: Atanasoff B0029

Assessment Policy: Grades (include plus/minus) will be determined based on the following:

Homework:

- Most weeks, homework will be assigned to be collected the following week in class. To accommodate unexpected events that may impact students ability to complete this assignments on time I will drop the lowest of the homework grades from the overall average.
- You are encouraged to work on homework with your peers. However, your problem sets must be written by you and only you, in your own words, and only with the calculations that you yourself did.
- Weekly homework assignments, along with their respective due dates, are be posted at $https://ashirazist.github.io/stat305_s2020.github.io/homework.html$. Homeworks will be due on Thursdays in class, unless otherwise notified in class and/or via email. Submission must be in hard copy form (printed + stapled) except under extenuating circumstances.
- If you cannot attend class on the due date, please arrange to submit your homework prior to the due date.
- **No late homework will be accepted.** If you are unable to attend class on the day the homework is due it is your responsibility to turn it in before the due date.

Quizzes: There will be four semester quizzes and a comprehensive final. The semester quizzes will be given during the lecture period and will be closed book. The final exam is comprehensive, and will be on May 5, Tuesday 02:15- 04:15. Location: Atanasoff B0029.

Weight: The components of a student's grade have the following weights:

Homework ..... 12% (assigned weekly)
Quizzes ..... 48% (4 Quizzes, 12% each)
Final Exam ..... 40% (May 5, Tuesday 02:15- 04:15., location: Atanasoff B0029)

Letter grades: Letter grades will be assigned based on the following ranges: A = 100-93, A- = 90-93, B+ = 87-90, B = 83-87, B- = 80-83, C+ = 77-80, C = 73-77, C- = 70-73, D+ = 67-70, D = 63-67, D- = 60-63, F = 60-0

Course Outline (tentative):

Introduction, Data Collection (Ch.1, 2) ..... Read syllabus carefully, HW1 assigned
Descriptive Statistics (sec. 3.1 3.2) ..... HW1 due, HW2 assigned
Descriptive Statistics, Line Fitting (Ch. 3.3, 4.1, 4.2) ... HW2 due, No homework assigned
Curve and Surface Fitting (sec. 4.2) **Quiz 1**, HW3 assigned
Random Variables (sec. 5.1) ..... JMP, HW3 due, HW4 assigned
Random Variables (sec. 5.1) ..... HW4 due, No homework assigned
Random Variables (sec. 5.2) ..... **Quiz 2**, HW5 assigned
Random Variables (sec. 5.2) ..... HW5 due, HW6 assigned
Random Variables (sec. 5.4, 5.5) ..... HW6 due, HW7 assigned
Spring break ..... No homework assigned
Random Variables, Simple Inference (sec. 5.5, 6.1) ..... HW7 due, No homework assigned
Simple Inference (6.1, 6.2) ..... **Quiz 3**, HW8 assigned
Simple Inference (6.2, 6.3) ..... HW8 due, HW9 assigned
Simple Inference (6.2, 6.3) ..... HW9 due, HW10 assigned
Simple Inference (6.3, 6.6) ..... **Quiz 4** HW10 due, No homework assigned
One Way Model CI's for Linear Functions of Means (7.1, 7.2) ..... HW11 assigned
One Way ANOVA, Control Charts, Review (7.4, 7.5) ..... HW11 due
Final Exam ..... December 18, Wednesday 09:45- 11:45., location TBA.

Academic Honesty: As an Iowa State University student, you have agreed to abide by the University's academic honesty policy (http://www.dso.iastate.edu/ja/academic/misconduct.html). Academic misconduct is a serious matter and student's suspected of academic dishonesty will be reported to the Dean of Students Office. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

Extra Help: Do not hesitate to come to my office during office hours or schedule an appointment to discuss a homework problem or any aspect of the course. If you want to hire an outsider tutor (i.e., for a fee), you can find possible tutors through the statistics department.

Disability Accommodation: Iowa State University complies with the Americans with Disabilities Act and Sect 504 of the Rehabilitation Act. If you have a disability and anticipate needing accommodations in this course, please contact your instructor (in this case, Ian Mouzon) to set up a meeting within the first two weeks of the semester or as soon as you become aware of your need. Before meeting with the instructor, you will need to obtain a SAAR form with recommendations for accommodations from the Disability Resources Office, located in Room 1076 on the main floor of the Student Services Building. Their telephone number is 515-294-7220 or email disabilityresources@iastate.edu. Retroactive requests for accommodations will not be honored.

Dead Week: This class follows the Iowa State University Dead Week policy as noted in section 10.6.4 of the Faculty Handbook http://www.provost.iastate.edu/resources/faculty-handbook .

Harassment and Discrimination: Iowa State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon race, ethnicity, sex (including sexual assault), pregnancy, color, religion, national origin, physical or mental disability, age, marital status, sexual orientation, gender identity, genetic information, or status as a U.S. veteran. Any student who has concerns

about such behavior should contact his/her instructor, Student Assistance at 515-294-1020 or email dso-sas@iastate.edu, or the Office of Equal Opportunity and Compliance at 515-294-7612.

Religious Accommodation: If an academic or work requirement conflicts with your religious practices and/or observances, you may request reasonable accommodations. Your request must be in writing, and your instructor or supervisor will review the request. You or your instructor may also seek assistance from the Dean of Students Office or the Office of Equal Opportunity and Compliance.

Contact Information: If you are experiencing, or have experienced, a problem with any of the above issues, email academicissues@iastate.edu.