Statistics 305
Engineering Statistics

TR 3:40 - 5:00 PM, Agronomy Hall 2020

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: Ian Mouzon (imouzon@iastate.edu, 3220 Snedecor Hall, 1-515-294-7891).

Resources:

Office hours	T 2:00-3:00 PM, TR 5:15-6:30 PM in 3220 Snedecor Hall.
Grader	Yushan Gu (yushang@iastate.edu, help hours tbd)
Web	Canvas (https://canvas.iastate.edu)
Software	JMP (free download at https://www.stat.iastate.edu/statistical-software)

Important Dates:

First Exam *(tentative)*	February 21st
Spring break	March 18th - March 22nd
Drop Deadline	March 29th
Second Exam *(tentative)*	April 9th
Course Final	May 8th, 12:00-2:00 pm (Wednesday)

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 accomodate 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.

Exams: There will be two semester exams and a comprehensive final. The semester exams will be given during the lecture period and will be closed book. The final exam is comprehensive and is scheduled for Wednesday, 05/08 from 12:00 - 2:00 PM.

Competency Quizzes: There will be four competency quizzes given during the semester, shortly after beginning chapter 5. The quizzes will allow you to demonstrate competency on the following topcs: discrete random variables, continuous random variables, joint distributions, and functions of random variables. Each topic will be graded as pass/fail. Multiple topics will be included on each quiz and you will have three chances to pass each topic. Once you have passed a topic, you do not need to repeat the topic on future quizzes (i.e., you have demonstrated competency). The topic schedule for the quizzes will is:

CQ1 ..... Discrete RVs; Continuous RVs
CQ2 ..... Discrete RVs; Continuous RVs; Joint Distributions; Functions of RVs
CQ3 ..... Discrete RVs; Continuous RVs; Joint Distributions; Functions of RVs
CQ4 ..... Joint Distributions; Functions of RVs

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

Homework ..... 30% (assigned weekly)
Competency Quizzes ..... 10% (4 topics, 2.5% each)
Exam 1 ..... 20% (02/21, in class)
Exam 2 ..... 20% (04/09, in class)
Final Exam ..... 20% (05/08, 12:00-2:00, location TBD)

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:

Introduction, Data Collection (Ch.1, 2) ..... 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, HW3 assigned
Curve and Surface Fitting (sec. 4.2) ..... HW3 due, HW4 assigned
Random Variables (sec. 5.1) ..... HW4 due, HW5 assigned
Random Variables (sec. 5.1) ..... **Exam 1**, covering Ch. 1 - 4
Random Variables (sec. 5.2) ..... HW5 due, HW6 assigned
Random Variables (sec. 5.2) ..... CQ1, HW6 due, HW7 assigned
Random Variables (sec. 5.4, 5.5) ..... CQ2, No homework assigned
Spring break ..... No homework assigned
Random Variables, Simple Inference (sec. 5.5, 6.1) ..... CQ3, HW7 due, HW8 assigned
Simple Inference (6.1, 6.2) ..... CQ4, HW8 due, HW9 assigned
Simple Inference (6.2, 6.3) ..... **Exam 2**, covering Ch. 5
Simple Inference (6.2, 6.3) ..... HW9 due, HW10 assigned
Simple Inference (6.3, 6.6) ..... No homework assigned
One Way Model CI's for Linear Functions of Means (7.1, 7.2) . HW10 due, HW11 assigned
One Way ANOVA, Control Charts, Review (7.4, 7.5) ..... HW11 due
Final Exam ..... 05/08, location to be announced.

Attendance: 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.

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.