STAT:1020:0100/PSQF:1020:0100
Elementary Statistics and Inference
Fall 2018 - evening class

Instructor: M. Russo, 269 SH, 353-2295, mary-russo@uiowa.edu

Class Time/Location: Eve Class (Sec 0100) Wed., 5:30 PM - 8:30 PM, 15 SH

Office Hours: Tues. 10:30 AM - 12:30 PM, Wed. 12:30 PM – 1:30 PM, and by appointment. Occasionally, hours may be rescheduled to accommodate students who wish to attend -- announcements of changes will be made in class and posted on the instructor's door (269 SH). Students seeking office-hour help are expected to have excellent attendance in the lectures and discussions.

Communication: Students should use only their University of Iowa email address, when corresponding with me via email.

Approved GE: Quantitative or Formal Reasoning. Courses approved in this area have as their primary purpose the development of the analytical powers of the student as they might be exercised in the presentation and evaluation of mathematical or other formal symbolic systems.

Course Objectives: This course introduces the major ideas of probability and statistics. Topics include descriptive statistics, the normal distribution, correlation and regression, elements of probability, chance error, expectation, standard error, sampling, logic of statistical inference, confidence intervals & hypothesis tests.

Prerequisite: MATH:0100 or MATH:1005 or equivalent. Students should be comfortable with math at the level of elementary algebra (e.g., points on a graph, the equation of a straight line, powers & roots, percentages).

Text: Intro Stats, 5th edition by De Veaux, Velleman, and Bock; Pearson Education, Inc., **5th ed.** (ISBN: 13: 978-0-13-421022-3). This is an excellent book with many good examples & exercises. Online access to MY STAT LAB is required for the course. The e-text is included with MY STAT LAB.

Students may choose to purchase a print copy of the text **with** online access, OR students may choose to purchase only online access and use the (included) e-text.

Additional course materials will be posted in CANVAS content. Students are required to print out these materials & bring them to class and discussions, as needed.

The Lectures: Topics from the text will be covered. Some additional material will be covered. Notation, theory, problems, and procedures will be explained in detail. Notes should be taken. Bring your printed course materials from CANVAS, and a calculator. Note that restrictions concerning calculators will be announced.

Attendance is required. A record of attendance will be made. Illness/injury is a legitimate reason to miss class; feeling a little under the weather is not. Note that **a missed class is equivalent to a missed week** and absences usually lead to lower scores on quizzes and exams.

The classroom environment: Students have the right to a classroom environment that encourages learning. **Arriving late or leaving early or conversing with fellow students during the lecture is discourteous and distracting to the instructor and to fellow students.** The learning environment is diminished when students engage in inappropriate classroom behavior such as reading newspapers or other non-class material, working on homework, using a cell phone, and using personal computers for non-class purposes such as web-surfing and facebook. More information concerning student rights and responsibilities in the classroom can be found at https://clas.uiowa.edu/students/handbook/student-rights-responsibilities

Homework assignments will consist of **online problems.** Occasionally, **supplemental problems** might be assigned.

The online problems and due dates will be posted on MY STAT LAB. These problems must be completed and submitted using MY STAT LAB.

Supplemental assignments and due dates will be posted on CANVAS. These assignments will be collected **at the beginning of class**, on the due date.

For each **supplemental problem,** show the necessary work and clearly indicate your answer. Include enough detail to demonstrate your method for finding the answer. Sketches and graphs are helpful. Please use a dark pencil (#2) or a black or blue pen.

Supplemental problems MUST BE **completed** directly on the pages printed from CANVAS.

Each **supplemental assignment** MUST include your **name as it appears on CANVAS**, date, and section number, printed in **INK,** in the top right hand corner. In addition, you may include your preferred name or nickname in parentheses. Please DO NOT write your student ID number on your homework papers.

Working Together on Homework: You are encouraged to study, discuss, and work on homework problems with others. However, you are required to complete and submit the online homework ON YOUR OWN. And, you are required to write the solutions to supplemental problems ON YOUR OWN, rather than copying the work of others.

Late Homework: Online homework must be submitted on time, for full credit. The points earned for online problems submitted late, but not more than 24 hours late, will be subject to a 50% reduction. Online homework submitted more than 24 hours late will not be accepted.

Supplemental homework is officially due at **the beginning** of class on the due date. Supplemental homework submitted after that time, but prior to 3 PM of the Friday following the due date, is subject to a 50% penalty. Supplemental homework submitted after that time, but prior to 3 PM of the Monday following the due date, is subject to a 75% penalty. All other submissions are subject to a 100% penalty.

If you are unable to make it to class on a supplemental homework due date, you should arrange to have your homework delivered on time (that is, by the beginning

of the class on the due date). Please note that supplemental homework will NOT be accepted electronically.

Online Quizzes (approximately 4), given online. **The online quizzes** and due dates will be announced in class and posted on MY STAT LAB. These quizzes must be completed and submitted using MY STAT LAB. A particular quiz can be opened anytime, during an announced 48 hour period. Once opened, a student may have up to 50 minutes to complete the quiz. Online quizzes are "open book" and consist of several "multiple choice" type problems. Online quizzes are not accepted late.

In-Class Quizzes (approximately 4), lasting about 15 minutes each, will be given during the class. In-class quiz dates and topics will be announced in class, the week before. In-class quizzes are "closed book" and consist of several "show your work" type problems. For each student, the lowest in-class quiz score will be dropped.

Exams will be "closed book" and multiple choice (or a combination of "show your work" and multiple choice.) For some of the exams, a small note sheet may be used. Details concerning note sheets and other exam policies, will be announced in class, one week before an exam.

The exams will cover material from the lectures, textbook, homework, and handouts.

Exam #1 Wednesday, October 3, (during class)
Exam #2 Wednesday, November 7, (during class)

Cumulative Final Exam DATE/TIME/ROOM(S) to be announced

The final exam will be held during finals week, as scheduled by the university. MyUI and the Registrar's webpage have links to the final exam schedule: https://myui.uiowa.edu/my-ui/home.page
Any changes in the exam schedule will be announced in class and/or by email.

Exam Protocol: About one week before an upcoming exam, a memo containing information about the exam will be posted on CANVAS or given out in class. A review session will be held for each exam. Review session attendance is optional.

Single-purpose calculators only (no smart devices) are to be used during quizzes and exams. Restrictions on calculators will be announced. Sharing calculators in NOT allowed. Students may not communicate with other students during the exams. If you leave an exam early, you risk missing a clarification, hint, or correction.

When you leave an exam, your question paper, stat tables, scrap paper (which will be given with the exam), note sheet (if allowed), and bubble sheet (if given with the exam), MUST be handed directly to the instructor or proctor. Then, your University of Iowa ID card must be presented. You must wait for an "OK" before leaving.

Cheating in all forms is taken very seriously. Cheating could result in the assignment of an "F" grade and disciplinary action by the college and/or university.

Absences and Make-ups: If you know that you will miss a quiz or exam, or if something unexpected comes up (emergency, illness, etc.) please let me (instructor) know as soon as possible prior to the exam, and we will discuss your situation and

possibly schedule a make-up. Please be prepared to show documentation of your situation. Not all situations are university approved. Additional information concerning the policy on missed exams and class work can be found at http://clas.uiowa.edu/students/handbook

Grading: The course grade will be calculated using the following weights: attendance = 2%, HW = 8%, online quizzes = 5%, in-class quizzes = 10%, exam 1 = 25%, exam 2 = 25%, final = 25%

The final course percent is a weighted sum of attendance, HW, quiz, midterm, and final exam grades:

Course % = (attendance fraction)(2%) + (Homework fraction)(8%) + (online quiz frac)(5%) + (in-class quiz frac)(10%) + (E1 frac)(25%) + (E2 frac)(25%) + (final frac)(25%)

As a rough guide, 90-100%=A- to A+, 80-90%=B- to B+, 65-80%=C- to C+, 50-65% = D- to D+

Throughout the semester, grades will be recorded on CANVAS. If you feel that a grade you have received on a paper or on CANVAS is incorrect, and you wish to have your paper reviewed, you must contact the instructor and resubmit the paper **within 8 days** of the first day that the relevant paper was made available in class or the relevant grade was posted on CANVAS.

Help is available during instructor office hours and TA review sessions. The Statistics Tutorial Lab is open to all students enrolled in the class; the Lab will post open hours for drop-in sessions. Students sometimes hire independent tutors. A list of tutoring resources is kept on the Statistics Dept. homepage: http://www.stat.uiowa.edu/resources/tutoring

Note that for qualified students, tutoring may be available through The Center for Diversity and Enrichment: http://diversity.uiowa.edu/cde

Information for students with disabilities: I would like to hear from anyone who has a disability which may require seating modifications or testing accommodations or accommodations of other class requirements, so that appropriate arrangements may be made. Please contact me during my office hours or by email.

Departmental Home: The Department of Statistics and Actuarial Science is the departmental home of this course. The department office is in 241 SH, phone 335-0712, web address: http://www.stat.uiowa.edu/

The Department Executive Officer (DEO) is Professor Lang, 241 SH, phone 335-0712, joseph-lang@uiowa.edu

STAT:1020:0100 – Planned order of chapters and topics (5th ed.)(Fall 2018):

August 22 – September 26:

Chapter 1: data and variables: introduction; types of variables

Chapter 2: displaying and describing data: summarizing and displaying a categorical variable; displaying a quantitative variable; describing shape, center, spread: modes, symmetry, skewness, outliers, median, mean, range, interquartile range, variance, standard deviation

Chapter 3: exploring the relationship between categorical variables: contingency tables; conditional distributions; displaying contingency tables; three categorical variables

Chapter 4: understanding and comparing distributions: using histograms, stem-and-leaf plots, boxplots, 5-number summaries; outliers

Chapter 5: the standard deviation and the normal model: z-scores; shifting and scaling; normal models; normal percentiles; normal probability plots

Chapter 6: scatterplots, association, and correlation: using scatterplots; finding the correlation coefficient; correlation vs. causation

Chapter 7: linear regression: the line of best fit; the linear model; finding the least squares line; regression to the mean; finding & examining residuals; R^2 – the variation accounted for by the model; regression assumptions and conditions

Chapter 8: understanding regression issues: extrapolation; influence of outliers; lurking variables; working with summary values; correlation vs. causation (again)

October 3 – Exam 1 – Exam 1 covers the material in chapters 1, 2, 3, 4, 5, 6, 7, 8, and the related lectures, discussions, worksheets, and problem sets.

October 3 – October 31:

Chapter 10: sampling: ideas of sampling; populations and parameters, samples and statistics, simple random samples, other sampling designs, sampling mistakes

Chapter 12: from randomness to probability: random phenomena; modeling probability; formal probability; the complement rule; disjoint events; the addition rule for disjoint events; the General Addition Rule; independence; the multiplication rule for independent events; the General Multiplication Rule; using tables, Venn diagrams, trees; reversing the conditioning; Bayes' Rule

Chapter 13: sampling distribution models and confidence intervals for proportions: sampling distribution model for a proportion; assumptions and conditions for using the normal model; confidence interval for a proportion; interpreting confidence intervals; margin of error; sample size

Chapter 14: confidence intervals for means: the Central Limit Theorem; assumptions and conditions; using the t-curve; confidence interval for a mean; interpreting confidence intervals; margin of error; sample size

November 7 – Exam 2 – Exam 2 emphasizes the material in Chapters 10, 12, 13, 14, and the related lectures, worksheets, and problems sets. However, students are also responsible for the material covered by Exam 1.

November 7 – December 5:

Chapter 15: testing hypotheses: hypotheses; P-values; the reasoning of hypotheses testing; one-proportion z-test; one-sample t-test for the mean; intervals and tests; P-values and decisions

Chapter 16: more about tests and intervals: interpreting P-values

Select topics *from Chapter 17 and/or Chapter 19:*

Chapter 17: comparing groups: the 2-sample z-test for the difference between two proportions; the 2-sample t-test for the difference between two means

Chapter 19: comparing counts: the chi-square curve; the chi-square goodness-of-fit test

Exam Week – Final Exam – The final exam is comprehensive and includes material covered throughout the course. However, about ½ of the final emphasizes the material covered after Exam 2 (Chapters 15, 16, and select topics from C17 & C19) and about ½ of the final emphasizes the earlier material.

Teaching Policies & Resources — Syllabus Insert

Administrative Home

The College of Liberal Arts and Sciences (CLAS) is the administrative home of this course and governs its add/drop deadlines, the second-grade-only option, and other policies. These policies vary by college (https://clas.uiowa.edu/students/handbook).

Electronic Communication

Students are responsible for official correspondences sent to their UI email address (uiowa.edu) and must use this address for all communication within UI (Operations Manual, III.15.2).

Accommodations for Disabilities

UI is committed to an educational experience that is accessible to all students. A student may request academic accommodations for a disability (such as mental health, attention, learning, vision, and physical or health-related condition) by registering with Student Disability Services (SDS). The student should then discuss accommodations with the course instructor (https://sds.studentlife.uiowa.edu/).

Nondiscrimination in the Classroom

UI is committed to making the classroom a respectful and inclusive space for all people irrespective of their gender, sexual, racial, religious or other identities. Toward this goal, students are invited to optionally share their preferred names and pronouns with their instructors and classmates. The University of Iowa prohibits discrimination and harassment against individuals on the basis of race, class, gender, sexual orientation, national origin, and other identity categories set forth in the University's Human Rights policy. For more information, contact the Office of Equal Opportunity and Diversity at diversity@uiowa.edu or diversity.uiowa.edu.

Academic Integrity
All undergraduates enrolled in courses offered by CLAS have, in essence, agreed to the College's Code of Academic Honesty. Misconduct is reported to the College, resulting in suspension or other sanctions, with sanctions communicated with the student through the UI email address.

CLAS Final Examination Policies
The final exam schedule for each semester is announced around the fifth week of classes; students are responsible for knowing the date, time, and place of a final exam. Students should not make travel plans until knowing this final exam information. No exams of any kind are allowed the week before finals. (https://clas.uiowa.edu/faculty/teaching-policies-resources-examination-policies.)

Making a Complaint
Students with a complaint should first visit with the instructor or course supervisor and then with the departmental executive officer (DEO), also known as the Chair. Students may then bring the concern to CLAS (https://clas.uiowa.edu/students/handbook/student-rights-responsibilities).

Understanding Sexual Harassment
Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community must uphold the UI mission and contribute to a safe environment that enhances learning. Incidents of sexual harassment must be reported immediately. For assistance, definitions, and the full University policy, see https://osmrc.uiowa.edu/.