The University of Iowa
The College of Liberal Arts and Sciences
Fall 2023

Title of Course: Applied Statistics I, STAT:5200
Course meeting time and place:

Lectures: 12:30-1:20 PM MWF 75 SH

Labs: 8:30-9:20 AM F 41 SH

Department of Statistics and Actuarial Science: https://stat.uiowa.edu

Course ICON site: To access the course site, log into Iowa Courses Online (ICON) https://icon.uiowa.edu/index.shtml using your Hawk ID and password.

Course Home:
For Undergraduate Courses: The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the add and drop deadlines, the "second-grade only" option (SGO), academic misconduct policies, and other undergraduate policies and procedures. Other UI colleges may have different policies.
For Graduate Courses: The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the policies and procedures for its courses. Graduate students, however, must adhere to the academic deadlines set by the Graduate College.

Prerquisites: STAT:3101 (22S:131) or equivalent, and knowledge of matrix algebra.

Corequisites: STAT:4100 (22S:153) or STAT:5100 (22S:193).

Instructor: Joyee Ghosh
Office location: 372 SH
Student drop-in hours:
Monday: 4:30-5:30 PM and Friday: 2:00-3:00 PM by Zoom
Wednesday: 2:00-3:00 PM in 241B SH
Students are invited to drop by during these hours to discuss questions about the course material or concerns. I am available by appointment if you are unable to attend my drop-in hours.
Phone: 319-335-0816
E-mail: joyee-ghosh@uiowa.edu
DEO: Professor Kung-Sik Chan, Office: 241 SH, Email: kung-sik-chan@uiowa.edu

Description of Course and Learning Objectives:
The main topic of this course is regression analysis, which involves modeling data, as well as accompanying diagnostic methods (to see if the model fits well) and statistical inference (to see how much we can infer from the fitted model about the population from which the data have been collected).

This is an applied statistics course, and some of your work will involve data analysis, computing and communicating statistical results. On the other hand, this is a graduate-level statistics course, and hence we will cover the material in some technical depth. We will cover chapters 1 through 7 of the textbook in the first eleven weeks or so. We will then cover chapters 9, 11 and/or other topics as time permits.

Textbook/Materials: Introduction to Regression Modeling, Abraham and Ledolter.

Academic Honesty and Misconduct:
All students in CLAS courses are expected to abide by the CLAS Code of Academic Honesty. Undergraduate academic misconduct must be reported by instructors to CLAS according to these procedures. Graduate academic misconduct must be reported to the Graduate College according to Section F of the Graduate College Manual.

Student Complaints:
Students with a complaint about a grade or a related matter should first discuss the situation with the instructor and/or the course supervisor (if applicable), and finally with the Director or Chair of the school, department, or program offering the course.

Undergraduate students should contact CLAS Undergraduate Programs for support when the matter is not resolved at the previous level. Graduate students should contact the CLAS Associate Dean for Graduate Education and Outreach and Engagement when additional support is needed.

Drop Deadline for this Course:
You may drop an individual course before the deadline; after this deadline you will need collegiate approval. You can look up the drop deadline for this course here. When you drop a course, a "W" will appear on your transcript. The mark of "W" is a neutral mark that does not affect your GPA. Directions for adding or dropping a course and other registration changes can be found on the Registrar's website. Undergraduate students can find policies on dropping and withdrawing here. Graduate students should adhere to the academic deadlines and policies set by the Graduate College.

Labs and Homework: We will use the statistical language R for this course, which can be downloaded from https://cran.r-project.org/ and is installed in the lab. Attendance in the labs is important for your success in the course. This is where you will learn how to use R (including under Linux), and use it for your assignments and project. Almost every week you will be asked to turn in your lab

assignment as Homework. The lowest HW score will be dropped to accommodate missed HW due to illness and other unavoidable circumstances. Please be considerate to the grader and double check that your uploaded documents are readable (not too small or large fonts etc.). You can discuss homework assignments with me or other students, but the final write-up should be from your own understanding. While assignments do not have to be type-written, please provide figures, output and R code etc.

Additional Homework assignments not to be turned in:
I expect to assign additional homework assignments covering both theory and applied problems. These will not be due but will appear on Quizzes and possibly on Exams.

Project: For the project you can either identify an appropriate dataset for which multiple linear regression/logistic regression is applicable, or create an interesting simulation study (for example severe multicollinearity, small sample size relative to the number of predictors, nonnormal errors for linear regression etc.) and generate fake data under it. The goal would be to analyze the real dataset using some of the statistical methods taught in class or compare the performance of different methods using simulation studies. You may include methods that have not been taught in class, but then you would be expected to have a good understanding of those methods. Some good resources for datasets are the DASL Library (The Data and Story Library) at http://lib.stat.cmu.edu/DASL/, the UCI Machine Learning Repository at http://archive.ics.uci.edu/ml/, and the MASS library in R. Please do not analyze data that have already been used in lectures, labs or homework assignments. You will submit i) a project proposal and ii) slides for an oral presentation to the class. The final presentation should address the following:

-Objective
-Brief description of the data (source, variable key etc. or simulation set up)
-Statistical methods used for data analysis/simulation study
-Summary of results (presented as figures or tables when applicable)
-Discussion of findings and your interpretation, any shortcomings, and/or future work
-Appendix for R code

Once you have identified the dataset or simulation topic, please submit a brief (maximum one-page description but can have extra pages of plots) project proposal by Wednesday, November 1, 2023. I am happy to talk with you about any questions regarding the project. The slides will be due on Tuesday, November 28, 2023, and the presentations (approximately 10-15 minutes each) will most likely be on November 29 and December 1, 2023.

Exams:
There will be a closed book 50 minutes midterm exam in class on Wednesday, October 18, 2023 (tentatively). You may bring a 8.5'' by 11'' hand-written formula sheet (write on one side only).

There will be a closed book two hours final exam (date to be announced later). You may bring a 8.5'' by 11'' hand-written formula sheet (write on both sides).

If an exam is missed, a make-up exam will be permitted only if the circumstances of missing the exam satisfy university policy (documentation will be required in such a case).

Quizzes:
There will be some (2-3) short quizzes to help you keep up with the material covered in class. The quizzes will be closed book and I will announce the date and syllabus around one week before each quiz. The policy for make-up quizzes is same as that of exams.

Attendance:
Regular attendance is expected.

Grading System and the Use of +/-:
A plus-minus grading system will be used. As a rough guide A,A-: 90-100%, B+,B,B-: 75-90%, C+,C,C-: 50-75%, D+,D,D-: 40-50%, F:<40%.
I may lower the cut-offs depending on the difficulty of the exam. The
A+ grade is rarely awarded.

Course Grades:
Final course grades will be assessed based on the following:

- Homework assignments (10%)
- Project (15%)
- Midterm exam (25%)
- Final exam (35%)
- Quizzes (15%)

Date and Time of the Final Exam:
The final examination date and time will be announced by the Registrar generally by the fifth week of classes and it will be announced on the course ICON site once it is known. **Do not plan your end of the semester travel plans until the final exam schedule is made public. It is your responsibility to know the date, time, and place of the final exam.** According to Registrar's final exam policy, students **have a maximum of two weeks after the announced final exam schedule** to request a change if an exam conflict exists or if a student has more than two exams in one day (see the policy here).

Other Expectations of Student Performance
Activities which are unacceptable are (1) prolonged conversation with a fellow student, (2) the use of cell phones, and (3) the use of laptops/tablets etc. in class unless it is used for taking notes. **Please remember to switch your phones to silent mode before class starts and put away laptops/tablets/phones etc. when in class.**

College of Liberal Arts and Sciences (CLAS) Course Policies:

Attendance and Absences

University regulations require that students be allowed to make up examinations that have been missed due to illness, religious holy days, military service obligations (including service-related medical appointments), or other unavoidable circumstances or University-sponsored activities. Students with UI-authorized activities must discuss their absences with the instructor as soon as possible. Religious obligations must be communicated within the first three weeks of classes.

Communication: UI Email

Students are responsible for all official correspondences sent to their UI email address (uiowa.edu) and must use this address for any communication with instructors or staff in the UI community. For the privacy and the protection of student records, UI faculty and staff can only correspond with UI email addresses.

Where to Get Academic Support for this Course

Students can use drop-in student hours listed in syllabus. Tutor Iowa central academic support site lists private tutors for some courses: https://tutor.uiowa.edu/.

Mental Health Resources and Student Support

Students are encouraged to be mindful of their mental health and seek help as a preventive measure or if feeling overwhelmed and/or struggling to meet course expectations. Students are encouraged to talk to their instructor for assistance with specific class-related concerns. For additional support and counseling, students are encouraged to contact University Counseling Service (UCS). Information about UCS, including resources and how to schedule an appointment, can be found at counseling.uiowa.edu. Find out more about UI mental health services at mentalhealth.uiowa.edu.

Student Care and Assistance provides assistance to University of Iowa students who are experiencing a variety of crisis and emergency situations, including but not limited to medical issues, family emergencies, unexpected challenges, and sourcing basic needs such as food and shelter. More information on the resources related to basic needs can be found at basicneeds.uiowa.edu/resources/. Students are encouraged to contact Student Care & Assistance in the Office of the Dean of Students (Room 135 IMU, dos-assistance@uiowa.edu, or 319-335-1162) for support and assistance with resources.

University Policies

Accommodations for Students with Disabilities

The University is committed to providing an educational experience that is accessible to all. If a student has a diagnosed disability or other disabling condition that may impact the student's ability to complete the course requirements as stated in the syllabus, the student may seek accommodations through Student Disability Services (SDS). SDS is responsible for making Letters of Accommodation (LOA) available. **The student must provide an LOA to the instructor as early in the semester as possible, but requests not made at least two weeks prior to the scheduled activity for which an accommodation is sought may not be accommodated.** The LOA will specify what reasonable course accommodations the student is eligible for and those the instructor should provide. Additional information can be found on the SDS website.

Free Speech and Expression

Absences for Religious Holy Days

Classroom Expectations

Non-discrimination

Sexual Harassment/Misconduct and Supportive Measures