



THE UNIVERSITY OF IOWA  
DEPARTMENT OF STATISTICS & ACTUARIAL SCIENCE

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STAT:5100 Statistical Inference I

Fall 2023

2:30–3:20 p.m., MWF

74 SH

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## Course Syllabus

### Contact Information

#### Instructor: Dr. Zhiwei (Josh) Tong

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This is the best way to contact me! Please include “STAT:5100” in your email subject.

- *Phone:* 1(319)467-0160

- *Office:* 374 SH

- *Office hours:* 1–2 p.m., MWF

Held in person unless otherwise announced. Also available by appointment.

- *Personal homepage:* <https://sites.google.com/view/ztong1997/home>

#### Grader: Ms. Qian Tang

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#### Department Executive Officer: Dr. Kung-Sik Chan

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## Course Description and Objectives

This course is intended for first-year graduate students in statistics, actuarial science, and other related disciplines. The instructor aims to deliver the fundamentals of probability theory and important techniques that are essential for statistical inference, in a rigorous yet comprehensible way. The topics covered in this course include, but are not limited to, probability theory, counting techniques, conditional distributions, distribution functions, transformations, expectations, common distributions, extensions to multiple random variables, dependence models, sampling distributions, order statistics, convergence concepts, and generating random samples. After taking this course, students will be well-equipped to progress to the subsequent inference course STAT:5101.

This course requires intensive and rigorous prior training in **calculus** and **linear algebra**. Students must be prepared to engage in calculations involving multivariate integrals, derivative computations, and matrix manipulations. Officially, the prerequisites for this course are MATH:2850 Calculus III and STAT:3101 Introduction to Mathematical Statistics II.

In view that this is a graduate-level course, students can expect that **certain abstract concepts** will be covered. This underscores the importance of attentive and active participation during lectures. Given the multitude of topics to cover, the instructor will strive to provide illustrative examples to enhance comprehension.

## Course Materials

The required textbook for this course is the second edition of *Statistical Inference* by George Casella and Roger L. Berger. We will cover most of the first five chapters of this book. You will find that problems from the book are useful for enhancing your understanding of the concepts.

Additionally, we will use **ICON** (<http://icon.uiowa.edu>) for announcements, lecture notes, homework assignments, etc. It is advised that you **print out and bring** a copy of the relevant portions of the lecture notes for each class meeting.

## Evaluation System

Final course grades will be assessed based on your performance in the following activities:

Item	Weight	Schedule
Attendance	5%	Attendance and active engagement are encouraged
Assignments	18%	7 assignments spread throughout the semester
Quizzes	12%	4 quizzes spread throughout the semester
Midterms	30%	2 midterm exams
Final	35%	TBA

- **Attendance: 5%**

Your attendance and engagement may affect your final grade (positively or negatively).

- **Assignments: 18%**

There will be an assignment every two weeks, totaling seven assignments throughout the entire semester. Assignments will be released on Fridays and will be due the following Friday. Your solutions are to be scanned and submitted via ICON. Late submissions will only be accepted at the instructor's discretion. Discussion with fellow classmates is encouraged, but the work you submit must ultimately be your own. The lowest assignment score will be dropped when calculating the final grade.

- **Quizzes: 12%**

There will be four 20-minute open-book quizzes. They are tentatively scheduled in class for the Fridays of Teaching Weeks 3, 7, 9, and 13, respectively. The purpose of the quizzes is to encourage regular study.

- **Midterm Examinations: 30%**

There will be two 45-minute open-book Midterm Examinations. They are tentatively scheduled in class for September 22 and November 3, respectively.

- **Final Examination: 35%**

There will be a comprehensive **closed-book** 2-hour Final Examination. It will be scheduled during the University Final Exam Week (December 11–15, 2023). The exact schedule will be announced both in class and on ICON once it is finalized by the Registrar.

If any schedule changes occur, the updated schedule will be communicated both during class and on ICON. If a specific evaluation item is missed due to unforeseen and unavoidable circumstances, scores from the other evaluation items will be weighted more heavily towards the final grade calculation.

**Grading scheme.** Plus/minus grades will be assigned in this course. An *approximate* guideline is given as follows:

Graduate students		
A- [86.5, 91)	A [91, 95.5)	A+ [95.5, 100]
B- [73, 77.5)	B [77.5, 82)	B+ [82, 86.5)
C- [59.5, 64)	C [64, 68.5)	C+ [68.5, 73)
D- [46, 50.5)	D [50.5, 55)	D+ [55, 59.5)
F [0, 46)		

## **Miscellaneous**

### **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 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 CLAS courses here. Graduate students should adhere to the academic deadlines and policies set by the Graduate College.

### **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.

### **Exam Policies**

## **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.

## **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](http://counseling.uiowa.edu). Find out more about UI mental health services at [mentalhealth.uiowa.edu](http://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 this website. Students are encouraged to contact Student Care & Assistance in the Office of the Dean of Students (Room 135 IMU, [dos-assistance@uiowa.edu](mailto:dos-assistance@uiowa.edu), or 319-335-1162) for support and assistance with resources.

## **University Policies**

On this website, you will find the university course policies and resources for students. You will find information about the following topics:

- Free Speech and Expression
- Absences for Religious Holy Days
- Classroom Expectations
- Non-discrimination
- Sexual Harassment/Misconduct and Supportive Measures
- Sharing of Class Recordings

## **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.