



# Statistical Inference I

Math 5080/6824, Section 001

Fall Semester 2021

## Instructor info:

Benjamin Cooper Boniece  
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Office: JWB 130

## Lecture info:

Time: M/W/F 10:45-11:35am  
Location: ~~Marriott Library 1130~~  
[Gardner Commons 4020](#)

**Important Note:** For additional details, resources, information on office hours, and the most up-to-date information regarding important class dates, please refer to the [Canvas page](#).

**Course Description:** An introductory course in mathematical statistics. Topics include sampling, sampling distributions, Central Limit Theorem, transformation of data, complete and sufficient statistics, point estimation, optimality.

**Prerequisites:** Probability (Math 5010).

**Text:** Introduction to Probability and Mathematical Statistics, 2<sup>nd</sup> Edition.

→ **Authors:** Lee J. Bain and Max Engelhardt.

→ **ISBN-13:** 978-0534380205

## Grade distribution:

Homework	30%
Midterm Exams (2)	40% (20% each)
Final Exam	30%

## Grade scale:

—	B+ [80, 86)	C+ [68,74)	—	—
A [93,100]	—	C [60,68)	D [50,55)	E [0,50)
A- [86,93)	B- [74, 80)	C- [55,60)	—	—

No grades will be rounded for any reason.

## Goals and Scope:

This course is about statistical inference and the mathematical theory that supports it. We will mostly focus on the setting where data is “i.i.d.,” meaning observed data is assumed to be independent and identically distributed. (If these words are only somewhat familiar to you, don’t worry too much yet – we’ll discuss them at length in class).

As a discipline, mathematical statistics is quite broad. In 5080/6824, will be focusing mainly on what is known as parametric inference and the theory of point estimation. At the end of this course, everyone will

- Understand some essential core concepts underlying parametric statistics and the theory of point estimation.
- Have a solid foundation for understanding more sophisticated statistical concepts.
- Be prepared to take Statistical Inference II if they so choose.

Important note: This is not a course in applied statistics. By design, this course is meant to be theory-focused with some level of mathematical rigor. However, having a good grasp of both theory and applications is important for anyone interested in data sciences. If you are looking instead to enroll in an applied statistics course, please contact me for possible alternatives.

## Course policies:

### General

- **No late homework will be accepted;** one homework assignment will be dropped at the end of semester.
- Exceptions are made only in extreme circumstances. For more details, please see section entitled Accommodations in the [Canvas page](#).
- If you have trouble submitting your work through Gradescope, please contact me prior to the assignment deadline.
- If you insufficient time to fix the issue before the deadline passes, to ensure you receive credit for the assignment, please email me a copy of your work.

### Homework

- Homework assignments will be completed through a service called Gradescope <https://gradescope.com/>.
- Assignments will be graded based on a mixture of completeness and correctness.
- While it is acceptable to briefly discuss individual assignments with your classmates, your work must reflect your personal understanding of the material (identical solutions will not be accepted or tolerated).
- Re-grades: Students have only one week to request the regrading of an assignment or an exam after the time that this has been returned to the class.

### Exams

- Tentative midterm exam dates have already been set for the semester. For up-to-date information on exam dates, please refer to Canvas. The final exam date has been set. As of August 21, 2021, the exam dates are:

- Midterm 1: Friday, October 1 (Tentative)
- Midterm 2: Wednesday, November 19 (Tentative)
- Final Exam: Wednesday, December 15, 10:30am-12:30pm

### Academic Honesty

- All students are expected to comply with the University of Utah's [student code](#).

### Accommodations

- Accommodations will be considered on an individual basis and may require documentation.
- See also [General University Policies](#), below.

## Covid-19 University Policies

University leadership urges all faculty, students, and staff to model the vaccination, testing, and masking behaviors we want to see in our campus community. These include:

**Vaccination:** We strongly urge you to get a COVID-19 vaccination if you have not already done so. Vaccination is proving highly effective in preventing severe COVID-19 symptoms, hospitalization and death from coronavirus. Vaccination is the single best way to stop this COVID resurgence in its tracks. Visit [mychart.med.utah.edu](http://mychart.med.utah.edu) or [vaccines.gov](http://vaccines.gov) to schedule your vaccination.

**Masking:** While masks are no longer required outside of Health Sciences facilities, UTA buses and campus shuttles, CDC guidelines now call for everyone to wear face masks indoors.

**Testing:** If you are not yet vaccinated, get weekly asymptomatic coronavirus tests. This is a helpful way to protect yourself and those around you because asymptomatic individuals can unknowingly spread the coronavirus to others. Saliva based testing is available at [alert.utah.edu/covid/testing](http://alert.utah.edu/covid/testing)

**Self-Reporting:** All of us, including faculty, students, and staff, must self-report if we test positive for COVID-19 via this website: [coronavirus.utah.edu](http://coronavirus.utah.edu).

## General University Policies

The following five items are standard syllabus items not directly related to Covid. Note, however, that some of the services described may be available only on a modified or limited basis due to the Covid pandemic. Check online or call the relevant unit for up-to-date information.

**The Americans with Disabilities Act:** The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability & Access, 162 Olpin Union Building, 801-581-5020, [disability.utah.edu](http://disability.utah.edu). CDA will work with you and the instructor

to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability & Access.

**Addressing Sexual Misconduct:** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted on the basis of your sex, office for equal opportunity and affirmative action including sexual orientation or gender identity/expression, you are encouraged to report it to the University's Title IX Coordinator; Director, Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, [oeo.utah.edu](http://oeo.utah.edu) or to the Office of the Dean of Students, 270 Union Building, 801-581-7066, [deanofstudents.utah.edu](http://deanofstudents.utah.edu). For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to police, contact the Department of Public Safety, 801-585-2677(COPS), [police.utah.edu](http://police.utah.edu).

**Campus Safety:** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit [safeu.utah.edu](http://safeu.utah.edu)

**University Counseling Center:** The UCC staff is committed to supporting the mental health needs of our campus community. Their phone number is 801-581-6826. Their hours are Monday-Friday, 8:00am-5:00pm. For after-hours emergencies, contact the 24/7 Crisis Line: 801-587-3000 . More information is at [counselingcenter.utah.edu](http://counselingcenter.utah.edu).

**Office of the Dean of Students:** The Office of the Dean of Students is dedicated to being a resource to students through support, advocacy, involvement, and accountability. It serves as a support for students facing challenges to their success as students, and assists with the interpretation of University policy and regulations. To contact the Office of the Dean of Students, please email [deanofstudents@utah.edu](mailto:deanofstudents@utah.edu) or call 801-581-7066. There is more information at [deanofstudents.utah.edu/](http://deanofstudents.utah.edu/).

## Inclusivity

**Student Names and Personal Pronouns.** Class rosters are provided to the instructor with the student's legal name as well as "preferred first name" (if previously entered by you in the Student Profile section of your CIS account, which managed can be managed at any time). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class or on assignments. Please advise me of any name or pronoun changes so I can help create a learning environment in which you, your name, and your pronoun are respected. If you need any assistance or support, please reach out to the LGBT Resource Center at [lgbt.utah.edu](http://lgbt.utah.edu)

**Diversity and Inclusivity Statement.** It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in

and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you.

**Undocumented Student Support Statement.** Immigration is a complex phenomenon with broad impact—those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801.213.3697 or visit [dream.utah.edu](http://dream.utah.edu).