



THE OHIO STATE UNIVERSITY

STAT 6801

Statistical Theory I (20956)

Autumn 2026

Syllabus - Graduate Instructor Information

Name: Steven MacEachern

Professional Qualifications

PhD, Statistics, University of Minnesota

Bachelor's, Mathematics, Carleton College

Syllabus - Required or Recommended Readings

The text for the course is Statistical Inference (2nd edition), by George Casella and Roger Berger. In this semester, we will focus on chapters 1-5. Some sections will be skipped (e.g., 5.6) and some additional material will be covered.

There are many good books on Statistical Theory. Casella and Berger takes a mathematical approach to the subject. Others are a bit softer mathematically but have a more lucid description of the central concepts. Two of my favorites along these lines are Statistical Theory by Bernie Lindgren (Third Edition) and Probability and Statistics by Morrie DeGroot (1st or 2nd edition, not the revised version with Schervish). The old classic, Mathematical Methods of Statistics, by Harald Cramer, is dated but wonderful. It is sharp, correct, and at a high mathematical level.

These older books are widely available. You may find them in the library or at a bargain price on the internet.

Syllabus - Course Schedule

The tentative course schedule is the following. All sections refer to Casella and Berger. I expect us to make modest departures from this schedule as the term progresses.

Week 1: sections 1.1-1.2.2

Week 2: sections 1.2.3-1.4

Week 3: sections 1.5-1.6

Week 4: sections 2.1-2.3

Week 5: sections 2.3-2.4

Week 6: sections 3.1-3.3

Week 7: sections 3.4-3.5

Week 8: sections 3.6; 3.8.1, part of 3.8.2

Week 9: sections 4.1-4.2

Week 10: sections 4.3-4.4

Week 11: sections 4.5-4.7

Week 12: sections 5.1-5.2

Week 13: sections 5.3-5.4

Weeks 14-15: sections 5.5

Weeks 16: review

Course Details - Instructor Contact Details

Email: maceachern.1@osu.edu

Course Details - Office Hours

Office hours: Monday, 11:30 - 12:30; Friday, 10:30 - 11:30; and by appointment

Office location: 440D Cockins Hall

Course Details - Additional Instructional Staff

The grader for this course is Torey Hilbert, a graduate student in the Statistics Department. Full contact information will be provided later.

Course Details - Class Meeting Details

Class Meeting Details: 08:50 AM-10:05 AM - Enarson Classroom Bldg 243 - MWF

Course Details - Course Description

Introduction to probability, random variables, distribution theory and principles of inference. Intended primarily for students in the PhD program in Statistics or Biostatistics. Prereq: Grad standing in Statistics or Biostatistics, or permission of instructor. Not open to students with credit for 6301 (610) or 620.

Prerequisite(s) / Corequisites: Prereq: Grad standing in Statistics or Biostatistics, or permission of instructor. Not open to students with credit for 6301 (610) or 620.

Course Details - More About This Course

This is the first course in a two-semester sequence on probability and theoretical statistics. The course is required for the MS and PhD in Statistics and for the PhD in Biostatistics. In it, we will cover the basics of probability, random variables, common distributions, distribution theory, concepts of convergence, and we will get a start on principles of inference.

Course Details - Course Supplies

The text.

A calculator capable of doing simple calculations (including a square root). The calculator should not have internet connectivity.

Course Details - Detailed Course Schedule

See above for the tentative course schedule.

Tentative midterm exam dates:

Monday, October 5

Friday, November 13

Final exam date (as scheduled by the registrar):

Monday, December 14, 10:00 - 11:45, in the morning, of course

Course Details - Grading Policy

Your numerical grade for this course will be computed on the basis of:

Homework Assignments – 15%

Midterm Exams (two) – 50%

Final Exam – 35%

Your two lowest homework scores will be dropped before computing your homework grade. If you miss a homework assignment, you will receive a zero for the assignment (likely one that you will drop).

Grades are tied to performance. Grades will not be lower than those on the 90/80/70/60 scale. Grade cutoffs will, in all likelihood, be lower than 90 for an A (of some sort) and lower than 80 for a B (of some sort). I reserve the right to make adjustments to grades if circumstances warrant.

Course Details - Grading Scale

See above. Grades are based on performance, not a set point scale.

Course Details - Other

Assignments:

The reading assignments will not be graded. But read the book. It's a good one.

You will have homework assignments at a pace of roughly one assignment per week. The baseline expectation is for you to spend two hours outside of class on this course for each nominal hour in class. Depending on your background and the pace at which you work, your actual time may be longer or shorter than this expectation.

Homework assignments will contain a mix of problems from the textbook and additional problems. The assignments will be available on Carmen. Solutions to the assignments will be available after the assignments are due.

The midterm exams will be closed book, closed notes. Each exam will take one class period. Tentative dates for the exams are Monday, October 5 and Friday November 13. These dates are tentative. They may change, depending on the pace of lectures.

Assignments will be due, in class, in hard-copy format. The choice of format is to make grading more efficient and to make it easier to provide you with feedback. For late assignments, one (business) day late is a deduction of 10%; two days late, of 20%; beyond two days late, the assignment will not be accepted.

Attendance:

The class is designed around the lectures. Attendance is strongly encouraged as is class participation. Over time, I have tracked the performance of regular class attenders and non-attenders. There is a substantial difference in performance for these two groups. Show up, read the book, do the homework (and a bit more, if time and inclination permit), and you will do well in class. If you have questions, ask in class or see me after class or during office hours.

If you are unable to attend due to illness or for other reasons, let me know. If, for example, you test positive for COVID or believe that you have symptoms, it is best that you take care of health concerns before worrying about this class. Let me know of the situation promptly and we will make special arrangements.

Course Details - AI Use Policy

The main purpose of this course is for you to learn the material and to increase your understanding of Statistics. For the homework assignments, you can talk with fellow students and you can work on the problems with them. You may even wish to look on the web or use AI tools when working on the homework. This is acceptable, but your write-up should be your own – not a direct copy of a classmate's work, of a solution found online, or a write-up produced by AI. The exams will be in-class. For them, you will work solely on your own, so make sure that you have command of the material. For exams, a basic calculator will be permitted but cell phones will not be permitted. Tables will be provided as needed.

Note that this policy of open discussion and use of AI on the homework is specific to this course. Other instructors and other courses may well have a different policy. Make sure that you understand the policy for each course that you take.

Also note: this is one class in the MS / PhD curriculum. The curriculum has been designed to give you the breadth of skills and knowledge needed to function as an effective professional statistician / biostatistician / data scientist. In addition to individual courses, to progress to a degree, you must take (and pass) a comprehensive examination or two that covers much of the curriculum. The best route to success in the program – and for your future career – is to absorb much from the courses while taking them and to then fill in gaps in knowledge when studying for the comprehensive exams.

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. I will report serious academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

Syllabus - University Policies

Office of Undergraduate Education - Standard Syllabus Statements

- [Academic Misconduct](#)
- [Religious Accommodations](#)
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- [Copyrights](#)
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- [Resources for Military-Connected Students](#)
- [Campus-wide Class Cancellations](#)