

Probability and Statistical Inference, PH 712—001, Fall 2025



Class Meeting Times: Mon/Wed 11:30 – 12:45.

Meeting Modality/Location: Zilber College of Public Health at 1240 N 10th St.

Instructor and Contact: Zhiyang Zhou (zhou67@uwm.edu).

Instructor Office Hours: By appointment.

Teaching Assistant and Contact: N/A.

Prerequisites and/or Special Skills Required: Graduate students and [MATH231(P)] and [MATH232(P)] or the consent of instructor.

Course Description: Introductory graduate-level course that provides students with a mathematical treatment and understanding of key concepts in probability theory and statistical inference, and their applications in public health.

Course Objectives:

- Understand foundational concepts in probability, including sample spaces, events, conditional probability, independence, and common probability distributions.
- Understand the principles of statistical inference, including point estimation, confidence intervals, hypothesis testing, and p -values.
- Apply statistical methods to real-world problems, interpreting the results in context and assessing assumptions.
- Use R software to simulate distributions, analyze data, and inferential procedures.
- Critically evaluate statistical conclusions, recognizing the role of sampling variability, model assumptions, and potential sources of bias.

Course Format: Face-to-face lectures. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part, without permission of the instructor.

Time Investment: Students are expected to dedicate a minimum of 48 hours per credit hour over the course of the semester. For this three-credit course, that translates to at least 144 total hours of engagement. This includes time spent in class as well as outside of class on activities such as reading, problem-solving, assignments, and exam preparation. As a general guideline, students should anticipate spending at least two hours outside of class for every hour spent in class.

Significant Course Due Dates: See below for a listing of major assignment due.

Assignment (Quantity)	Dates Due (Estimated)
Homework (6)	Every other Sunday starting on Sep 21 (i.e., Sep 21, Oct 05, Oct 19, Nov 02, Nov 16, and Nov 30)
Final project	Dec 14

Important UWM Dates: Course dates can be found at [the Registrar's Add/Drop Calendar](#) and the [Registrar's list of Important Dates By Term](#).

First day of classes	Sep 02
Last day to add, change to/from credit/no credit audit status	Sep 08
Last day to drop without a "W"	Sep 29
Last day to drop	Nov 09
Thanksgiving Break	Nov 26
Last day of classes	Dec 11
Study Day	Dec 12
Final examination period	Dec 13 - 20, except Dec 14
Graduation Ceremony	Dec 14
Grading deadline	Dec 29

Required Readings: Course materials that are regularly posted at [the instructor's homepage](#) and Canvas. These materials are released for private study and research, and must not be shared. They must be used in a responsible, efficient, ethical and legal manner for educational purposes only.

Recommended Readings: [HMC] R. Hogg, J. McKean, & A. Craig. (2018). *Introduction to Mathematical Statistics*, 8th Ed. Boston: Pearson.

Technology Requirements: Students are permitted to use software packages such as [R](#) to facilitate computations.

Course Interactions:

- Students are required to use UWM email accounts for all communication with the instructor/TA.
- Students are encouraged to discuss general questions—but not answers to specific questions in assignments or examinations—with their peers. However, all written work must be completed and submitted individually. Copying any part of another person's work is strictly prohibited and will result in disciplinary action.
- Students are expected to complete readings and assignments before class to participate meaningfully in discussions and problem-solving sessions. Questions are encouraged. Clarifying concepts benefits everyone and helps reinforce understanding.

GRADING & ASSIGNMENT POLICIES

Assignment and Grading Policies: The homework and final project contribute to the final percentage score with proportions 60% and 40%, respectively.

Assignment (Quantity)	Where Submitted	Dates Due (Estimated)	Point Value
Homework (6)	Canvas	Every other Sunday starting on Sep 21 (i.e., Sep 21, Oct 05, Oct 19, Nov 02, Nov 16, and Nov 30)	10 points each
Final project	Canvas	Dec 14	40
TOTAL			100

Grading Scale: Final letter grades will be assigned based on final percentage grades per the following thresholds.

Letter Grade	Percentage Score	Letter Grade	Percentage Score
A	93 – 100	C	73 – 76
A-	90 – 92	C-	70 – 72
B+	87 – 89	D+	67 – 69
B	83 – 86	D	63 – 66
B-	80 – 82	D-	60 – 62
C+	77 – 79	F	0 – 59

Attendance Policies: Though there is no penalty on absence, it is better to be present in the designated lecture room punctually. Since the course will be delivered without any forms of recording, there is no alternative way of attendance.

Assignment Policies on Makeup or Late work: No late submissions will be accepted. Timely submissions will be graded and returned within two weeks. Students with personal or medical emergencies should contact their instructor as soon as possible. Late policies may be adjusted with appropriate documentation.

UWM POLICIES & RESOURCES

UWM Syllabus link: Please refer to the webpage of [University's Syllabus Links](#), which contains a link to the Uniform Syllabus Policy and a list of syllabus links to policies pertaining to students with disabilities, absences due to religious observation, students called to active military duty, incompletes, discriminatory conduct, Title IX, academic misconduct, complaint procedures, grade appeal procedures, LGBT+ resources, and final exam policies.

- If you need special accommodations to meet any of the course requirements, please contact me as soon as possible (and visit [the Accessibility Resource Center](#)).
- Students will be allowed to complete examinations or other requirements that are missed because of a religious observance or call to active military duty.

Academic Integrity Policy*: Include information on what is expected behavior for using and citing the work of others. Providing examples of what is and is not acceptable behavior helps students understand and follow the policy. Here is additional UWM [information on academic misconduct](#). Moreover, for online courses, see [CETL's tips on academic integrity in online learning for instructors and students](#).

Statement on the use of Artificial Intelligence Engines in completing course assignments:

Students are permitted to use Generative Artificial Intelligence (GenAI) tools, such as [Microsoft Copilot](#), to support their learning. These tools may assist with understanding course content, brainstorming ideas, and revising written drafts. However, final submissions for assignments and

projects must reflect students' own work and should not be entirely generated by GenAI. If GenAI tools are used, proper citation is required. For guidance on citing AI-generated content, please refer to the resource on [using and citing GenAI](#), provided by [UWM Libraries](#). Taking credit for any work that is not original, whether in whole or in part, constitutes academic misconduct and may lead to disciplinary action under [UWS Chapter 14](#). While GenAI can be helpful, it is essential to use them responsibly and ethically. AI-generated content may be biased, inaccurate, incomplete, or otherwise unreliable. Students must critically evaluate any output from GenAI before incorporating it into academic work.