



THE OHIO STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

SYLLABUS: STAT 7201

PROBABILITY

AUTUMN 2026

Course overview

Instructor

Instructor: David J. Sivakoff
Email address: dsivakoff@stat.osu.edu
Class Website: Carmen
Lectures: MWF at 10:20-11:15am in 228 Cockins Hall
Office hours: Thursday 9-10am and by appointment (please schedule appointments at least 24 hours in advance).
Office: 440A Cockins Hall

Course description

STAT 7201 is a measure-theoretic probability course. Complementing earlier courses on the topic, our focus will be on developing a deeper understanding of the modern mathematical theory of probability and its relevance to statistics. Students will also develop their ability to construct and communicate rigorous mathematical proofs.

Course learning outcomes

By the end of this course, students should successfully be able to:

- understand probability models from a measure-theoretic perspective,
- write rigorous proofs using mathematical probability concepts,
- connect probabilistic concepts and results to their statistical applicability.

Course materials

Required

A Probability Path by S. Resnick, Birkhauser, 2005. The book is available for download here: <https://link-springer-com.proxy.lib.ohio-state.edu/book/10.1007%2F978-0-8176-8409-9>

Supplemental References

Probability: Theory and Examples by R. Durrett, Duxbury Press;

Probability and Measure by P. Billingsley, Wiley, 1995;

A Course in Probability Theory, by K.L. Chung, Academic Press, 1990;

Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** <http://ocio.osu.edu/selfservice>
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TEL:** 614-688-8743

Baseline technical skills necessary for this course

- Basic computer and web-browsing skills
- Navigating Carmen

Necessary equipment

- Computer: current Mac or PC with high-speed internet connection.

Course delivery

Lectures will be delivered live in person. Office hours will usually be in person, but appointments can be made to meet via CarmenZoom. Lectures and office hours may occasionally be held via CarmenZoom, but when this happens an Announcement will be posted on the course website.

Grading and faculty response

Assignments and Grading

Assignment or category	Percentage
Quizzes	35
Midterm Exam	30
Final Exam	35
Total	100

Grades will be recorded on the class website.

Homework. I will not collect homework for grading purposes. The textbook listed above contains a large collection of practice problems. Students are encouraged to attempt many of these problems in preparation for the in-class assessments. A list of suggested problems will be available on Carmen. I will post sample solutions to some problems for you to model your solutions after. You may use AI tools to better understand the course material, check or improve your solutions, or ask for hints. Be aware that, as with internet or human source, the answers provided by AI tools may not be complete, accurate or meet course expectations. In the end, you must understand the material and how to write cogent proofs to succeed in the course.

Quizzes: All assessments will take place in person during lecture on the assigned day and take up to 15 minutes. The lowest score will be dropped at the end of the semester. Assessments must be completed alone without the use of textbook or notes. Use of any other materials are forbidden, including any websites, software packages or AI tools. A calculator is allowed, but only one that does not have computational algebra capabilities.

Midterm Exam: The midterm will take place during class on Wednesday, October 14. It will cover all material discussed in lecture prior to that date. More details will be discussed closer to the time of the exam.

Final Exam: The final exam is comprehensive and will take place on Tuesday, December 15 at 10:00-11:45am in our regular classroom. The final exam will cover all the material for the course.

I expect to use the following assignment of letter grades based on the assessment weightings in the table above.

A	> 79.99%	B	45 to 54.99%	C	10 to 24.99%
A-	65 to 79.99%	B-	35 to 44.99%	C-	0 to 9.99%
B+	55 to 64.99%	C+	25 to 34.99%		

Late assignments

Late assignments will generally not be accepted, as the lowest assessment score will be dropped to account for a missed assignment. If you cannot participate in the course for a prolonged period due to personal illness or family responsibilities, please contact me immediately to discuss options for completing work.

Faculty feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

Grading and feedback

For weekly homework, you can generally expect feedback within **7-10 days**.

E-mail

I will reply to e-mails within **24 hours on school days**.

Attendance, participation, and discussions

Student participation requirements

The following is a summary of everyone's expected participation:

- **Live, in-person lectures: THREE TIMES PER WEEK**
Students will be expected to participate and ask questions during live lectures.
- **Logging in: AT LEAST TWICE PER WEEK**
Students are required to log in to the course in Carmen each week, including weeks with holidays. (During most weeks you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible*.
- **Office hours: OPTIONAL**
All office hours are optional.

Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:** While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using proper grammar, spelling

and punctuation. Informality (including an occasional emoticon) is acceptable for non-academic topics.

- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

Artificial Intelligence and Academic Integrity

There has been a significant increase in the popularity and availability of a variety of generative artificial intelligence (AI) tools, including ChatGPT, Sudowrite, and others. These tools will help shape the future of work, research and technology, but when used in the wrong way, they can stand in conflict with academic integrity at Ohio State.

All students have important obligations under the Code of Student Conduct to complete all academic and scholarly activities with fairness and honesty. Our professional students also have the responsibility to uphold the professional and ethical standards found in their respective academic honor codes. Specifically, students are not to use unauthorized assistance in the laboratory, on field work, in scholarship, or on a course assignment unless such assistance has been authorized specifically by the course instructor. In addition, students are not to submit their work without acknowledging any word-for-word use and/or paraphrasing of writing, ideas or other work that is not your own. These requirements apply to all students undergraduate, graduate, and professional.

To maintain a culture of integrity and respect, these generative AI tools should not be used in the completion of course assignments unless an instructor for a given course specifically authorizes their use. Some instructors may approve of using generative AI tools in the academic setting for specific goals. However, these tools should be used only with the explicit and clear permission of each individual instructor, and then only in the ways allowed by the instructor.

Disclaimer

This syllabus should be taken as a fairly reliable guide for the course content. However, you cannot claim any rights from it and in particular we reserve the right to change due dates or the methods of grading and/or assessment if necessary. Any changes will be communicated to you through official course announcements.

Tentative schedule of topics.

Week	Dates	Topics
1	8/26 – 8/28	Introduction, Set operations and limits
2	8/31 – 9/4	Sigma-fields, Borel sigma-field, Measure/Probability spaces
3	9/9 – 9/11	Distributions, Pi-Lambda and Extension theorems
4	9/14 – 9/18	Random variables, Induced measures
5	9/21 – 9/25	Independence
6	9/28 – 10/2	Zero-one laws, Tail sigma-field
7	10/5 – 10/9	Lebesgue integration, MCT, Fatou's lemma
8	10/12 – 10/14	Radon-Nikodym Thm, Conditional Expectation
9	10/19 – 10/23	Conditional Expectation, L^p spaces, Product spaces
10	10/26 – 10/30	Modes of convergence, Uniform integrability
11	11/2 – 11/6	Weak Law of Large Numbers (LLN), Strong LLN
12	11/9 – 11/13	Strong LLN, Random Series
13	11/16 – 11/20	Convergence in distribution
14	11/23	Convergence in distribution
15	11/30 – 12/4	CLTs
16	12/7 – 12/9	CLTs

Other course policies

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Please **do not disseminate any course materials, including any lecture videos, assignments, and solutions** outside of the course.

Academic integrity policy

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. Instructors shall report all instances of alleged academic misconduct to the committee ([Faculty Rule 3335-5-48.7 \(B\)](#)). For additional information, see the [Code of Student Conduct](#).

Grievances and Solving Problems

According to University Policies, if you have a problem with this class, you should seek to resolve the grievance concerning a grade or academic practice by speaking first with the instructor or professor. Then, if necessary, take your case to the department chairperson, college dean or associate dean, and to the provost, in that order. Specific procedures are outlined in Faculty Rule 3335-8-23. Grievances against graduate, research, and teaching assistants should be submitted first to the supervising instructor, then to the chairperson of the assistant's department.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a welcoming community. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Civil Rights Compliance Office (CRCO):

Online reporting form: <http://civilrights.osu.edu/>
Call 614-247-5838 or TTY 614-688-8605
civilrights@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Civil Rights Compliance Office to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Mental health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling [614-292-5766](tel:6142925766). CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at [614-292-5766](tel:6142925766) and 24 hour emergency help is also available 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

Disability services

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

If you are ill and need to miss class, including if you are staying home and away from others while experiencing symptoms of a viral infection or fever, please let me know immediately. In cases where illness interacts with an underlying medical condition, please consult with Student Life Disability Services to request reasonable accommodations. You can connect with them at slds@osu.edu; 614-292-3307; or slds.osu.edu.

Religious accommodation

Ohio State has had a longstanding practice of making reasonable academic accommodations for students' religious beliefs and practices in accordance with applicable law. In 2023, Ohio State updated its practice to align with new state legislation. Under this new provision, students must

be in early communication with their instructors regarding any known accommodation requests for religious beliefs and practices, providing notice of specific dates for which they request alternative accommodations within 14 days after the first instructional day of the course. Instructors in turn shall not question the sincerity of a student's religious or spiritual belief system in reviewing such requests and shall keep requests for accommodations confidential.

With sufficient notice, instructors will provide students with reasonable alternative accommodations with regard to examinations and other academic requirements with respect to students' sincerely held religious beliefs and practices by allowing up to three absences each semester for the student to attend or participate in religious activities. Examples of religious accommodations can include, but are not limited to, rescheduling an exam, altering the time of a student's presentation, allowing make-up assignments to substitute for missed class work, or flexibility in due dates or research responsibilities. If concerns arise about a requested accommodation, instructors are to consult their tenure initiating unit head for assistance.

A student's request for time off shall be provided if the student's sincerely held religious belief or practice severely affects the student's ability to take an exam or meet an academic requirement and the student has notified their instructor, in writing during the first 14 days after the course begins, of the date of each absence. Although students are required to provide notice within the first 14 days after a course begins, instructors are strongly encouraged to work with the student to provide a reasonable accommodation if a request is made outside the notice period. A student may not be penalized for an absence approved under this policy.

If students have questions or disputes related to academic accommodations, they should contact their course instructor, and then their department or college office. For questions or to report discrimination or harassment based on religion, individuals should contact the [Civil Rights Compliance Office](#). (Policy: [Religious Holidays, Holy Days and Observances](#))

Intellectual diversity

Ohio State is committed to fostering a culture of open inquiry and intellectual diversity within the classroom. This course will cover a range of information and may include discussions or debates about controversial issues, beliefs, or policies. Any such discussions and debates are intended to support understanding of the approved curriculum and relevant course objectives rather than promote any specific point of view. Students will be assessed on principles applicable to the field of study and the content covered in the course. Preparing students for citizenship includes helping them develop critical thinking skills that will allow them to reach their own conclusions regarding complex or controversial matters.