Stat 513
Mathematical Statistics 1
Fall 2025

Contact and Office Hour Information

Name	Role	Email	Office	Office Hours
Sam Baugh	Instructor	samuelbaugh@psu.edu	Thomas 413	MW 10:00-11:00
Siyu Huang	TA	sph6006@psu.edu	Third floor lounge	F 12:00-13:00

I will have office hours after class (on Monday and Wednesday) in my office, Thomas 413. In case of overflow we will move to Thomas 424, right across the hall. Feel free to stop by for any reason! The reason for no office hours after class on Friday Stochastic Modeling, Applications, and Computation (or "SMAC") seminar series will be taking place on Fridays at 10:10am, which you are also encouraged to attend!

Course Materials

The following textbooks will be referenced in this course. For all three, you should be able to download pdfs using the provided links.

- *Elements of Distribution Theory*, Sevirini, DOI: https://doi.org/10.1017/CBO9780511610547
  Relevant sections: Chapters 1-7, 12
- *Probability Theory and Examples*, Durrett, PDF:
  https://sites.math.duke.edu/~rtd/PTE/PTE5_011119.pdf
  Relevant sections: Chapters 1-3
- Rudin, *Fundamental of Real Analysis*. PDF:
  https://www.lehman.edu/faculty/rbettiol/lehman_teaching/2020mat320/baby_Rudin.pdf
  Relevant sections: Chapters 1-7, 11

Assignments and Assessments

There will be three exams, each consisting of 25% of your grade, which are scheduled to take place in-class on the Wednesdays of weeks 5, 9, and 13. The remainder of your grade will consist of "regular" assignments (10%), and the final assignment/project (15%).

Assignments will be posted and submitted on gradescope (not canvas). There will be approximately 7 regular assignments, one for each topic. Assignment due dates will be announced 1-2 weeks in advanced.

Grade breakdown:

Type	Percent
Exam 1	25%
Exam 2	25%
Exam 3	25%
Regular Assignments	10%
Final Assignment	15%

Course Topics

The course will cover the following main topics. Each topic will be covered in approximately two weeks, and correspond to one assignment.

1. Axioms of probability, random variables, and related concepts from set-theory
2. Distributions of random variables, and related topics on sequences and continuity
3. Integration and expectation
4. Joint and conditional distributions
5. Sequences and limits of random variables
6. Moment generating functions, characteristic functions, and the central limit theorem
7. Parametric families of distributions

Course Schedule

Week	Date (Monday)	Topic	Assignment/Exam	Notes
1	Aug 25	Topic 1		
2	Sep 1	Topic 1	Assignment 1	No class Monday: Labor Day
3	Sep 8	Topic 2		
4	Sep 15	Topic 2	Assignment 2	
5	Sep 22	Topic 2,3	**Exam 1** (Wednesday)	
6	Sep 29	Topic 3	Assignment 3	
7	Oct 6	Topic 3		
8	Oct 13	Topic 4	Assignment 4	
9	Oct 20	Topic 4-5	**Exam 2** (Wednesday)	
10	Oct 27	Topic 5	Assignment 5	
11	Nov 3	Topic 5		
12	Nov 10	Topic 6	Assignment 6	
13	Nov 17	Topic 6	**Exam 3** (Wednesday)	No class Friday
Thanksgiving				
14	Dec 1	Topic 7		
15	Dec 8	Topic 7	Assignment 7	
Finals Week	Dec 17	No class	Final Assignment	

Penn State Resources and Information
Academic Integrity Statement

Penn State and the Eberly College of Science are committed to maintaining Penn State's policy on Academic Integrity in this and all other courses. We take academic integrity matters seriously and expect you to become a partner to the University/College standards of academic excellence. For more information, please review these policies and procedures:

1. College of Science Academic Integrity Resources:
   https://science.psu.edu/current-students/integrity
2. Penn State World Campus Academic Integrity Resources:
   https://student.worldcampus.psu.edu/a-z-index/academic-integrity

While utilizing additional sources outside of this class is encouraged for gaining a better understanding of course concepts, seeking explicit answers for graded assignments from outside sources (e.g. Course Hero, Chegg, ChatGPT, tutoring services like tutor.com, etc.) is considered CHEATING and will not be tolerated. Sanctions range from failure of the assignment or course to dismissal from the University. Additionally, sharing course

content without permission is a violation of copyright and may result in university sanctions and/or legal ramifications. Contact your instructor with questions related to this topic.

Academic Adjustments Identified by the Office of Student Disability Resources

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. Student Disability Resources (SDR) website provides contact information for every Penn State campus. For further information, please visit the Student Disability Resources website: http://equity.psu.edu/sdr/.

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: http://equity.psu.edu/sdr/guidelines. If the documentation supports your request for reasonable accommodations, your campus disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early as possible. You must follow this process for every semester that you request accommodations.

Reporting Educational Equity Concerns through the Report Bias Website

Penn State University has adopted a "Protocol for Responding to Bias Motivated Incidents" that is grounded in the policy that the "University is committed to creating an educational environment which is free from intolerance directed toward individuals or groups and strives to create and maintain an environment that fosters respect for others." That policy is embedded within an institution traditionally committed to academic freedom. Bias motivated incidents include conduct that is defined in University Policy AD 91: Discrimination and Harassment, and Related Inappropriate Conduct. Students, faculty, or staff who experience or witness a possible bias motivated incident are urged to report the incident immediately by doing one of the following:

- Submit a report via the Report Bias webpage: http://equity.psu.edu/reportbias/
- Contact one of the following offices:
    1. University Police Services, University Park: 814-863-1111
    2. Multicultural Resource Center, Diversity Advocate for Students: 814-865-1773
    3. Office of the Vice Provost for Educational Equity: 814-865-5906
    4. Office of the Vice President for Student Affairs: 814-865-0909
    5. Affirmative Action Office: 814-863-0471
    6. **Dial 911 in cases where physical injury has occurred or is imminent**

Counseling & Psychological Services Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual

and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

1. Counseling and Psychological Services at University Park (CAPS): 814-863-0395.
   http://studentaffairs.psu.edu/counseling/
2. Penn State Crisis Line (24 hours/7 days/week): 877-229-6400
3. Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741