



Theory of Stats I: Distribution

STP 501

Instructor Info —



Shiwei Lan



Office Hrs: TTh 10:45a - 11:45a



<https://asu.zoom.us/j/8055899886>



<https://math.la.asu.edu/~slan>



slan@asu.edu

Course Info —



Prereq: Calculus, Linear Algebra



TTh 1:30 – 2:45 PM



Tempe WXLRA113



<https://slan-teaching.github.io/STP501/>

Grader Info —



TBD



Office Hrs: TBD



MC²



TBD

Description

This course introduces rigorous probability theory, including distributions and expectations of random variables, transformations of random variables and order statistics, generating functions and basic limit concepts. It supplements the understanding of applied statistics with a firm grasp of the probabilistic underpinnings of theoretical statistics.

Objective

By the end of this course, students should learn theories of random variables, random vectors, random samples and basic stochastic processes.

Textbooks

Required

SI - Statistical Inference (2nd Edition) by George Casella, Roger L. Berger

Supplementary

EDT - Elements of Distribution Theory (1st Edition) by Thomas A. Severini

Grading Scheme

Homework	40 %
Midterm Exam	30 %
Comprehensive Final	30 %
Total	100 %

A+	[97%, 100%]	A	[93%, 97%)	A-	[90%, 93%)
B+	[87%, 90%)	B	[83%, 87%)	B-	[80%, 83%)
C+	[77%, 80%)	C	[70%, 77%)		
D	[60%, 70%)			E	[0%, 60%)

Homework

There will be about 6 written assignments to be submitted on canvas. The lowest homework grade will be dropped. Each homework assignment is worth 10 points with total 50 points. Your answers must COMPLETE answers fully describing how you arrived at your final solution. While you may discuss the homework with your classmates, the final solutions must be your own. Written homework report should be submitted in either Word or PDF format, no other formats accepted. Late homework will NOT be accepted by email. The grade of late homework will be discounted by 1/3 per day. Homework late for more than 2 days will not be graded.

Exams

For the midterm and final exams, you will be permitted one 8.5×11 sheet of paper with notes (one side for midterm, two sides for the final). A handwritten note is strongly recommended. The final exam will cover the entire semester. Rescheduled exams will be allowed only under exceptional circumstances. (or for reasons listed below) and only with prior notification. No calculators will be permitted. All excuses must be verifiable.

Syllabus Disclaimer

This syllabus is tentative and should not be considered definitive. The instructor reserves the right to modify it (including the dates of the tests) to meet the needs of the class. Every effort will be made to avoid changing the course schedule but the possibility exists that unforeseen events will make syllabus changes necessary. It is the student responsibility to attend class regularly and make note of any change.

FAQs

? Where can I find help?

! You can go to my virtual office hours and the grader's office hours. In addition, you can go to [slack STP 501 channel](#) to post your questions and help others.

? How do I keep track of the class?

! Constantly check canvas and the course website. I will make announcements, post homework solutions, etc..

? Do we have incentives?

! I will give bonus points through the semester for e.g. extra-credit homework problems, most helpful slack users, etc..

? When shall I drop if I choose to?

! Last Day to Register or Drop/Add Without College Approval is 08/23/2023. Tuition & Fees Refund Deadline is 08/30/2023 for session C. Course Withdrawal Deadline (without 'W' on your transcript) is 11/01/2023 for session C. Refer to <https://students.asu.edu/academic-calendar> for more deadlines.

Disability Accommodations

Qualified students with disabilities are encouraged to make their requests at the beginning of the semester to get disability accommodations. Disability information is confidential. Note: Prior to receiving disability accommodations, verification of eligibility from the Disability Resource Center (DRC) is required. Therefore, you should contact DRC immediately. Their office is located on the first floor of the Matthews Center Building. DRC staff can also be reached at: 480-965-1234 (V), 480-965-9000 (TTY). For additional information, visit: www.asu.edu/studentaffairs/ed/drc. Their hours are 8:00 AM to 5:00 PM, Monday through Friday.

Make-up Policy

In case of valid absence (such as serious illness, going to court, etc.) during scheduled exam, you must notify the instructor BEFORE the exam, if the circumstances allow. To be eligible for make-up exam, valid excuse has to be supported by valid documentation (such as doctor's note, letter from court, etc.). Also, please follow Academic Affairs Manual, ACD 304-04, for appropriate University policies about requesting an accommodation for religious practices, in case you have to miss an assignment due to religious practice.

Cell phones and Electronic Devices

Picture taking, talking or texting on your cell phone or any electronic device during class is prohibited. If you bring a cell phone and/or any other electronic equipment to the class, make sure they are turned off before class begins. Any sounds produced by such devices are disruptive to the class and, as such, will not be tolerated and may be reported to the Office of the Dean of Students.

Academic Honesty

ASU expects and requires all its students to act with honesty and integrity, and respect the rights of others in carrying out all academic assignments. For more information on academic integrity, including the policy and appeal procedures, please visit <http://provost.asu.edu/academicintegrity>.

Inclusion

The School of Mathematical and Statistical Sciences encourages faculty to address and refer to students by their preferred name and gender pronoun. If your preferred name is different than what appears on the class roster, or you would like to be addressed using a specific pronoun, please let me know.

Sexual Violence and Harassment

Both Title IX federal law and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <https://sexualviolenceprevention.asu.edu/faqs>. As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, <https://eoss.asu.edu/counseling>, is available if you wish to discuss any concerns confidentially and privately. ASU online students may access 360 Life Services, <https://goto.asuonline.asu.edu/success/online-resources.html>.

Class Schedule (tentative)

Week	Date	Topic	Assignments
1	08/17 - 08/18	Introduction	
2	08/21 - 08/25	Probability Theory	HW 1 out
3	08/28 - 09/01	Random Variables and Distribution Functions	
4	09/05 - 09/08	Expectation and Moments	HW 1 due; HW 2 out
5	09/11 - 09/15	Moment Generating/Characteristic Functions	
6	09/18 - 09/22	Common Families of Distributions	HW 2 due; HW 3 out
7	09/25 - 09/29	Specific Continuous and Discrete Distributions	
8	10/02 - 10/06	Random Vectors	HW 3 due; HW 4 out
9	10/09 - 10/13	Fall break / Exam	midterm-exam: 10/12/2023
10	10/16 - 10/20	Multivariate Distributions	
11	10/23 - 10/27	Order Statistics	HW 4 due; HW 5 out
12	10/30 - 11/03	Random Samples	
13	11/06 - 11/10	Large Sample Theory	HW 5 due; HW 6 out
14	11/13 - 11/17	Data Reduction	
15	11/20 - 11/22	Parameter Estimation	HW 6 due
16	11/27 - 12/01	Review	
Final	12/04 - 12/09	Final Exam	final exam: 12/05/2023