

Introduction to Mathematical Statistics

INSTRUCTOR: Myoungshic Jhun
CLASS: Mon, Wed 2:00 -3:20 pm, Room: TBA
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OFFICE HOURS: Mon, Wed 10:00 - 11:30 am or by appointment

Text: George Casella and Roger L. Berger, *Statistical Inference*, 2nd ed., Duxbury Press.

Topics to be covered:

Sampling distribution; convergence concepts; classes of statistical models; sufficient statistics; likelihood principle; point estimation; testing statistical hypothesis; consistency; large sample theory etc;

Homework: Assignments will be given regularly. No late homework will be accepted. The lowest homework score will be dropped before computing your average.

Tests:

Exam I: Monday, March 28, in class
Exam II: Monday, May 2, in class
Final: TBA

Grading of Tests and Homework

Grading will be based on the following:

Homework (10%), Midterms ($25\% \times 2 = 50\%$), Final exam (40%)

Learning Outcomes

1. Understand mathematical concepts on statistical methods in:
 - probability and distributions;
 - sampling;
 - estimation;
2. Demonstrate skills with solutions for basic statistical methods including:
 - expectation, variance and moment generating functions for various distributions;
 - consistency and limiting distributions;
 - maximum likelihood methods, empirical methods, random number generation and other techniques.
3. Understand mathematical properties of methods used in statistics.

- Apply knowledge derived from the mathematical subjects including calculus, analysis, and linear algebra;
 - Provide a derivation for statistical formulae;
 - Demonstrate the ability to follow, construct, and write mathematical proofs.
4. Demonstrate understanding of how statistics is used in the solution of real-world problems.
- Demonstrate understanding of the assumptions, derivation of formulae, interpretation of results from statistical analysis;
 - Understand the meaning of the statistical theorems and formulae, and the implication of it in real problems.

Academic Integrity

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>

Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.

Course Evaluations

Stony Brook University values student feedback in maintaining the high quality education it provides and is committed to the course evaluation process, which includes a mid-semester assessment as well as an end-of-the-semester assessment, giving students a chance to provide information and feedback to an instructor which allows for development and improvement of courses. Please click the the following link to access the course evaluation system: <http://stonybrook.campuslabs.com/courseeval/>

Attendance Policy

- (1) Unexcused absences will affect the students final grade in the course.
- (2) If a student has over 20% unexcused absence, the students final course grade will be an F.
- (3) When a student excuses his/her absence, the student must provide documentation of the reason for the absence to the instructor.
- (4) The instructor of the course reserves the right to excuse absences.

Tentative Course Schedule

	Dates	Sections	Topics	Homework
1	2/21, 2/23	Chapter 1	Probability Theory	
2	2/28, 3/2	Chapter 2	Transformation and Expectations	
3	3/7, 3/14	Chapter 3	Common Families of Distributions	
4	3/16, 3/21	Chapter 4	Multiple Random Variables	
5	3/23, 3/28		Review, Exam 1	
6	3/30, 4/4	Chapter 5	Properties of Random Sample	
7	4/6, 4/11	Chapter 6	Principle of Data Reduction	
8	4/13, 4/18	Chapter 7	Point Estimation	
9	4/20, 4/25	Chapter 7	Point Estimation	
10	4/27, 5/2		Review, Exam 2	
11	5/4, 5/11	Chapter 7	Point Estimation	
12	5/16, 5/18	Chapter 8	Testing	
13	5/23, 5/25	Chapter 8	Testing	
14	5/30, 6/7		Supplements (Testing etc.) and Review	