MATH170A: PROBABILITY THEORY

Summer 2019

GENERAL INFORMATION

Instructor	Hanbaek Lyu	(Email: *hlyu@math.ucla.edu*, Office: MS 6156)
Lectures	MWR 9:00AM - 10:50AM at Franz Hall 2258A	Course webpage
Office hours	(tentative) MWF 11:00AM - 12:00PM at MS 6156	
Textbook	Introduction to Probability by D. P. Bertsekas and John N. Tsitsiklis, 2nd edition	
Prerequisites	Math 33A	
TA	MALDAGUE, JEAN-MICHEL	(Email: *jmmaldague@ucla.edu* , Office: MS 2963)

COURSE DESCRIPTION

In this course we study foundations of probability theory. The key concept is random variable, which is a mathematical device that is designed to describe outcomes of uncertain observations. We learn various essential random variables, their properties, and how to quantify and manipulate them.

GRADING

- Final score will be the maximum of the following schemes:
  - **Scheme 1**: Homework (15%) + Midterm 1 (20%) + Midterm 2 (20%) + Final (45%)
  - **Scheme 2**: Homework (15%) + max(Midterm 1, Midterm 2) (30%) + Final (55%)
- All grades will be posted via MyUCLA gradebook.

HOMEWORK

- Homeworks will be assigned weekly on every Wednesdays, and are due at the beginning of the class on following Wednesday.
- No late homeworks will be accepted.
- Two lowest homework scores will be dropped.
- A random sample of problems will be graded by the TA.
- Solutions on some selected problems will be posted in the course website.
- Discussing homework problems with the instructor, TA, or classmates are encouraged. But you need to write your own solution with your own understanding.

EXAMS

- There are two midterms and one final exam.
  - **Midterm 1**: Monday, Jul.8 in class.
  - **Midterm 2**: Monday, Jul.22 in class.
  - **Final**: Thursday, Aug. 1 in class.
- There is no make-up exam. You should attend the final exam to pass the course.
- Please bring your UCLA ID card to all exams.

TENTATIVE COURSE SCHEDULE

Below is a tentative course schedule based on the departmental guideline. There could be a slight change depending on our progress.

Week	Date	Section	Topics
1	M 6/24	1.1, 1.2	Sets, Probabilistic models
	W 6/26	1.2, 1.3	Probabilistic models, Conditional probability
	R 6/27	1.3, 1.5	Conditional probability, Independence between events
2	M 7/1	1.5, 2.1, 2.2, 2.4	Independence between events, Discrete random variables, expectation, and variance
	W 7/3	2.5, 2.6	Binomial, Geometric, and Poisson RVs, Joint PMFs of Multiple RVs
	R 7/4		No class (Independence day)
3	M 7/8		**Midterm 1**
	W 7/10	2.7	Conditioning discrete RVs, Conditional expectation of discrete RVs
	R 7/11		Independence between discrete RVs and events
4	M 7/15	3.1	Continuous RVs and PDFs, Uniform, Exponential, and Normal RVs
	W 7/17	3.4, 3.5	Joint PDFs of multiple RVs, Conditioning continuous RVs
	R 7/18	3.5, 3.6	Conditional expectation of continuous RVs, The continuous Bayes rule
5	M 7/22		**Midterm 2**
	W 7/24		Counting and Stirling's Formula, de Moivre-Laplace CLT
	R 7/25		Normal approximation of binomial RVs, Markov's & Chebyshef's inequalities
6	M 7/29		The Weak Law of Large Numbers
	W 7/30		Review
	R 8/1		**Final**