

MA246 - Probability and Random Processes

Course objective

This course provides an exposition of the basic theories on probability and random processes. Students going through the course will develop the problem solving skills and understand how to make the transition from a real problem to a probability model.

Class hours and venue

Class hours: 10:00am – 10:50am, MWF; Venue: LT B

Instructor

Dr. Kwok Yue-Kuen, Office Room Number: 3447, Tel: 2358-7418;

Office hours: 2:30pm - 3:30pm, MWF or by appointment

E-mail: maykwok; web page: <http://www.math.ust.hk/~maykwok/>

* All lecture notes can be downloaded from the instructor's home page.

Textbook

Probability and Random Processes for Electrical Engineering, Second Edition, Alberto Leon-Garcia, Addison-Wesley (1994)

Course content

1. Basic concepts of probability theory
 - 1.1 Specifying random experiments (Sec. 2.1)
 - 1.2 Axioms of probability (Sec. 2.2)
 - 1.3 Conditional probability and Bayes law (Sec. 2.4)
 - 1.4 Independence of events (Sec. 2.5)
 - 1.5 Notion of a random variable (Sec. 3.1)
 - 1.6 Cumulative distribution function and probability density function (Sec. 3.2 - Sec. 3.3)
2. Single random variables
 - 2.1 Discrete random variables: Binomial and Geometric (Sec. 3.4)
 - 2.2 Continuous random variables: Poisson and Normal (Sec. 3.4)
 - 2.3 Functions of a random variable (Sec. 3.5)
 - 2.4 Expected value of a random variable (Sec. 3.6)
3. Multiple random variables
 - 3.1 Pairs of random variables. Conditional probabilities (Sec. 4.2 - Sec. 4.4)
 - 3.2 Functions of several random variables (Sec. 4.5 - Sec. 4.8)
 - 3.3 Sum of random variables (Sec. 5.1)
4. Random processes
 - 4.1 Characterization of a random process. Sum processes (Sec. 6.1 and 6.3)
 - 4.2 Poisson processes (Sec. 6.4)
 - 4.3 Discrete time Markov chains (Sec. 8.1-8.2)

Grading policy

two 50-minute mid-term tests	2 x 25%
100-minute final examination	50%

- Materials that have been tested will not appear again in subsequent test or final examination.
- Four homework sets.