IMPTE

International Master's Program in Telecommunication Engineering

Course Name: Random Processes 隨機過程

Course Objects:

1. The course is intended as an introduction to the mathematical theory of probability and random process for students in communications engineering. It aims to develop fundamental concepts and methods of this field and illustrate their applications through some examples.
2. After successfully completing the course, students should be well prepared to take on courses in the applications of probability theory, such as communications systems, signal processing, and information theory.

Course Syllabus:

1. Introduction of Random Processes
2. Independence and Bernoulli Trials
3. Random Variables
4. Binomial Random Variable Applications, Conditional Probability Density Function and Stirling's Formula.
5. Function of a Random Variable
6. Mean, Variance, Moments and Characteristic Functions
7. Two Random Variables
8. Joint Moments and Joint Characteristic Functions
9. General concept of a random process
10. Random Walks and Other Applications
11. Spectral Representation
12. Spectrum Estimation
13. Mean Square Estimation
14. Some special topics