

ECM5102 — Stochastic Processes

Course Brief :

This course provides students with the necessary (i.e., fundamental and advanced) background on stochastic processes.

Instructor :

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Text :

Athanasios Papoulis & S. Unnikrishna Pillai, *Probability, Random Variables and Stochastic Processes*. Fourth edition, Mc Graw Hill, 2002.

Lecture Schedule :

Friday BCD (9:00am~noon)

Class Room :

SC 204 (基礎科學教學研究大樓)

Teaching Assistant :

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Grading System :

Your final grade for this course will be contributed 50% from the two midterms, 25% from the final exam and 25% from three quizzes.

- Section 9-3: First Quiz (March 31)

- Section 10-3: First Midterm (April 14)
- End of Chapter 10: Second Quiz (April 28)
- End of Chapter 11: Second Midterm (May 19)
- End of Chapter 12: Third Quiz (June 2)
- End of Chapter 13: Final Exam (June 16)

Coverage :

- Chapter 9: General Concepts
 - 9-1 Definitions
 - 9-2 Systems with Stochastic Inputs
 - 9-3 The Power Spectrum
 - 9-4 Discrete-Time Processes
- Chapter 10: Random Walks and Other Applications
 - 10-3 Modulation
 - 10-4 Cyclostationary Processes
 - 10-5 Bandlimited Processes and Sampling Theory
 - 10-6 Deterministic Signals in Noise
 - Appendix 10A The Poisson Sum Formula
- Chapter 11: Spectral Representation
 - 11-1 Factorization and Innovations
 - 11-2 Finite-Order Systems and State Variables
 - 11-3 Fourier Series and Karhunen-Loève Expansions
 - 11-4 Spectral Representation of Random Processes
- Chapter 12: Spectrum Estimation
 - 12-1 Ergodicity
 - 12-2 Spectrum Estimation
- Chapter 13: Mean Square Estimation
 - 13-1 Introduction
 - 13-2 Prediction (Partially, 12-3 Lattice Filters and Levinson's Algorithm)