

Department: Mathematics and Computer Sciences

Division: Statistics

Level and Major: Graduate

Course Title: Advanced Probability

Number of Credits: 4

Prerequisite: Probability

Lecturer:

Course Description: The Course aims to Basic knowledge in conditional Probability and expectation with respect to a sigma field and Martingales

Course Topics:

- 1- Filtered Probability Space, filtration and stochastic processes adapted to a filtration, natural filtration.
- 2- Absolutely continuity and density of a measure with respect to another measure. Radon–Nikodym theorem, Definition of conditional probability with respect to a sigma field: existence and uniqueness with probability one.
- 3- Properties of conditional probability with respect to a sigma field. Definition and properties of conditional expectation with respect to a sigma field. Definition and properties of martingale and sub martingale with respect to filtration.

The Course aims to: Basic knowledge in conditional Probability and expectation with respect to a sigma field and Martingales

Reading Resources:

- 1- Probability and Measure third edition: by Patrick Billingsley
- 2- Probability and Examples: by Richard Durrett

Evaluation: