Biostatistics 680/Mathematics 627: Applications of Stochastic Processes
Fall 2013

Instructor: Xiaoquan (William) Wen, Ph.D.

Lectures: MW 8:30am - 10:00am, Room M4318, SPH II

Office Hours: MW 10:00am - 11:00, Room 4517, SPH II

Required Text: None. Lecture notes will be made available on CTools.

Recommended References:

- Stochastic Processes, Doob. Wiley Interscience.

Prerequisites: Biostat 601 or equivalent

Topics:

- Conditional probability and expectation
- Generating functions and convolution
- Discrete and continuous time Markov processes
- Renewal processes
- Point processes
- Browning motion and Gaussian processes
- Martingales
- Applications in biostatistics

Competency: The student will learn and will be tested on the following competencies:
• Describe advanced concepts of probability and commonly used statistical probability distributions and stochastic processes.

• Master the mathematical techniques in modeling and inference of correlated random variables.

• Applying advanced probability theory in biostatistical applications.

• Build mathematical foundations for advanced studies in survival, longitudinal and time-series data analysis.

• Study and implement advanced computational techniques for applications in biostatistics.

Grading:

1. 30% homework.

2. 30% each of two midterms. Each midterm will cover half the course.

3. 10% class participation.

4. No final exam

Academic Integrity:

The faculty of the School of Public Health believes that the conduct of a student registered or taking courses in the School should be consistent with that of a professional person. Courtesy, honesty and respect should be shown by students toward faculty members, guest lecturers, administrative support staff and fellow students. Similarly, students should expect faculty to treat them fairly, showing respect for their ideas and opinions and striving to help them achieve maximum benefits from their experience in the School.

Student academic misconduct refers to behavior that may include plagiarism, cheating, fabrication, falsification of records or official documents, intentional misuse of equipment or materials (including library materials), and aiding and abetting the perpetration of such acts. The preparation of reports, papers, and examinations, assigned on an individual basis, must represent each student’s own effort. Reference sources should be indicated clearly. The use of assistance from other students or aids of any kind during a written examination, except when the use of aids such as electronic devices, books or notes has been approved by an instructor, is a violation of the standard of academic conduct.