

Math 540/ Stat 565: **Stochastic Processes**

Instructor: Dr. Guoyi Zhang, gzhang123@gmail.com SMLC 318

Time and Location: MWF 14:00-14:50 SMLC 356

Office hours: MWF 15:00-16:00

Textbook: Introduction to Probability Models 10th Edition by Sheldon M. Ross

Prerequisites: Stat 561 Probability

Course Description: This course will cover discrete and continuous time Markov Chains and applications, Stationary Distributions, Poisson Processes, Brownian Motion, Brownian Measure/ Stochastic Integration, Gaussian Processes. We may add or delete from this list depending on time, student interests, etc. After completing the course, students should be familiar with the more popular stochastic models and how to make use of these models in real applications.

Tentative Schedule

Chapters 1, 2 & 3: Probability Review (2 classes)

Chapter 4: Discrete Time Markov Chains (7 classes)

Midterm 1: Covers Chapters 1, 2, 3, and 4

Chapter 5: Exponential Distribution and Poisson Process (5 classes)

Chapter 6: Continuous Time Markov Chains (5 classes)

Midterm 2: Covers Chapters 5 and 6

Chapter 10: Brownian Motion and Stationary Processes (6 classes)

Final Exam: All topics covered in the course

Grading Policy

- Homework Assignments will be given about every 2 weeks to make for about a total of 6 assignments.
- 2 midterm exams will be given as described in the schedule above. Final exam problems may contain elements of any topics that we cover during the semester.
- Grade Distribution Homework (30%), Midterms (40%) Final Exam (30%)