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

Instructor: Dr. Yan Lu, luyan@math.unm.edu

Time and Location: 12:30-13:45 TR, MITCH 119

Office hours: TR 1:50pm-3:20pm or by appointment

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. We will use the R programming language occasionally to simulate realizations from some of the processes we will be studying. R is available on the department machines and can also be downloaded for free at http://www.r-project.org/.

Tentative Schedule

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

Chapter 4: Discrete Time Markov Chains (7 classes)

Quiz 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)

Quiz 2: Covers Chapters 5 and 6

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

Chapter 11: Simulation (2 classes)

Quiz 3: Covers Chapter 10

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 about 7-8 assignments.
- quizzes or mini-exams will be given as described in the schedule above. Quiz problems will be similar to those in the homework. A Final Exam is scheduled for

Thursday 05/13 from 10:00am - 12:00pm. Final exam problems may contain elements of any topics that we cover during the semester.

- Grade Distribution Homework (35%), Quizzes (45%) Final Exam (20%)
- grading scale

  95 - 100 = A+

  85 - 94 = A

  70 - 84 = B

  55 - 69 = C

  45 - 54 = D

  0 - 44 = F