EBGN561 - Stochastic Models

Spring 2012

Lectures  Monday, Wednesday  9:30am - 10:45am  211 Engineering Hall
Instructor  A. M. Newman
Office:     319 Engineering Hall
Office Hours:  Monday 12:30pm-2:30pm
              Tuesday 5:00pm-8:00pm
email:      newman@mines.edu

Teaching   Gerry Gonzalez, Kris Pruitt
Assistants Office:  215 Engineering Hall
(TAs)       Office Hours:  Wednesday 8:00am-9:00am

GENERAL INFORMATION

• Textbooks:

• Assignments: There will be a weekly assignment due on Wednesday in class the following week. Please direct any homework grading questions to the TAs, who will be grading the homework assignments. *Do not send email to the TAs!!*

• Project: There will be a project involving formulating, solving and analyzing a challenging problem, writing code, and/or performing a literature review. The project group may consist of between one and four students. The project will be due during finals week and should relate to your thesis work, if applicable.

• Exams: There will be a midterm and a final examination. Both are open book. You must wait 48 hours after the exam has been handed back to ask (me) any grading questions.
• Grading:
  ⋆ Class Participation: 5%
  ⋆ Homework Assignments: 20%
  ⋆ Project: 25%
  ⋆ Midterm: 20%
  ⋆ Final: 30%

Grading is done on a curve where 90% is sufficient but not necessarily necessary for an A-, 80% is sufficient but not necessarily necessary for a B-, etc.

COURSE OUTLINE

• I. Introduction and Review of Probability Models
  ⋆ Sample spaces, events, basic rules
  ⋆ Conditional probabilities
  ⋆ Bayes’ Formula

• II. Random Variables
  ⋆ Discrete random variables
  ⋆ Continuous random variables

• III. Conditional Probabilities
  ⋆ The discrete case
  ⋆ The continuous case

• IV. Markov Chains
  ⋆ Discrete Markov Chains
  ⋆ Continuous-time Markov chains

• V. Queuing Theory
  ⋆ Birth and death processes
  ⋆ M/M/s-type systems
  ⋆ M/G/*-type systems
  ⋆ Queuing networks
• VI. Reliability Theory
  * Systems with independent components
  * System life

• VII. Brownian Motion
  * Gambler’s Ruin
  * Pricing stock options

• VIII. Simulation

RULES

• Please do not send email regarding homework problems; come to office hours instead.

• Statute of limitations for questions about grading is one week from the student’s receipt of the graded work.

• Do not harass the TAs.

• I do not want to see or hear your cell phone. Ever. This includes during office hours.

• No rudeness of any kind towards anyone in the class will be tolerated.

• Do not talk to your neighbor during class.

• You may confer with others regarding the homework and project, but the work you hand in must be your own. Please ensure it is done neatly.

• Attendance in class is required. Be on time.

• Any alternate arrangements for exams must be submitted in writing at least one week in advance of the exam. Any additional arrangements regarding disabilities must be formally and legally documented and approved.

A minor infraction of the above rules will result in a warning. A major infraction will result in expulsion from the class.