STAT4850/7850: Introduction to Stochastic Processes
Spring Semester, 2016
Time: 11:00-11:50, MWF
Location: MDLBH 10
Instructor: Athanasios Christou Micheas, Ph.D.
Office: 134G Middlebush Building
Office Hours: 12:10-12:50, MWF (Also by appointment)
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Course Web Site:
• http://www.stat.missouri.edu/~amicheas/stat4850/index.html

Text:
• NOTES

Recommended:
• Introduction to Stochastic Processes, 1975, Erhan Cinlar, Prentice-Hall.

Prerequisites: STAT 4750/7750 or instructor’s consent.

Topics to be covered:
• Review and Complements to Probability and Distribution Theory, Matrix Theory:
  – Probability spaces and random variables
  – Expectation and Independence
  – Spectral Decomposition Theorem
• Bernoulli Processes and sums of independent random variables
• Poisson Processes:
  – Arrival Counting Processes
  – Times of arrivals
  – Superposition-Decomposition-Compound-Non stationary Poisson processes
• Markov Chains: Introduction, visits to fixed states, classification of states
• Limiting behavior and applications of Markov chains:
  – Recurrent, Periodic, Transient, Recurrent, Periodic, Transient states
  – Application to Queueing Systems
  – Birth-Death Processes
  – Branching processes
  – Potentials, Excessive functions, optimal stopping
• Markov Processes:
  – Sample path behavior, structure
  – Limit theorems
  – Birth-death processes

• Renewal and Markov Renewal Processes (time permitted)
  – Regenerative processes and renewal theory
  – Markov renewal processes and applications

• Martingales and Brownian Motion (time permitted)

Homework:
• There will be about seven problem sets assigned during the semester.

• When submitting your homework:
  – Display clearly on the top of the first page: your name(last, first), the course name and section and the assignment number.
  – Homework should be done on standard-size paper (8 1/2" by 11").

Exams:
• There will be two midterm examinations and a comprehensive final exam. The dates for the exams are as follows (same room for all, MDLBH 10):
  – Midterms during class time: 1) Friday, February 26, 2) Friday, April 8.
  – FINAL EXAM: TBA

• Examinations must be taken at the scheduled times. Make-up exams will not be given.
• All exams are closed book. Calculators are allowed to help in numerical calculations.
• If you require special assistance please contact the instructor immediately.

Grading:
Your grade will be based on a weighted average of your midterm scores (25%), homework average (20%), and final exam score (30%).

Homework Submission:
All homework must be turned in at the beginning of class on the due date. The only exceptions are acts of God, illness (doctor’s note expected), or death in the family (provide obit.).

Students with disabilities:
If you anticipate barriers related to the format or requirements of this course, if you have emergency medical information to share with me, or if you need to make arrangements in case the building must be evacuated, see me privately after class or at my office.

If disability related accommodations are necessary (for example, a note taker, extended time on exams, captioning), please register with the Office of Disability Services (http://disabilityservices.missouri.edu), S5 Memorial Union, 573- 882-4696, and then notify me of your eligibility for reasonable accommodations. For other MU resources for persons with disabilities, click on "Disability Resources" on the MU homepage.
**Academic Honesty:**

Academic honesty is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person’s work has been responsibly and honorably acquired, developed and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards academic dishonesty as an extremely serious matter, with serious consequences that range from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult the course instructor.

**Intellectual pluralism:**

The University community welcomes intellectual diversity and respects student rights. Students who have questions concerning the quality of instruction in this class may address concerns to either the Departmental Chair or Divisional leader or Director of the Office of Students Rights and Responsibilities (http://osrr.missouri.edu/). All students will have the opportunity to submit an anonymous evaluation of the instructor at the end of the course. An email will be send to you about how to complete this process during the last few weeks of the semester.

**Cell Phones:**

It is your responsibility as a student of this university, to have your cell phones, ipods, kindles, etc., closed before entering the classroom. If a cell phone rings, you text, or you use electronic devices during a lecture or exam, the instructor has the right to impose disciplinary sanctions, ranging from reduction of your final grade, probation to expulsion from the lectures. Only one warning will be given. Using cell phones in class is not proper university conduct. If you are expecting an important phone call for medical emergencies make sure you inform the instructor before the class/exam begins.