SSIE 660 Stochastic Systems
Fall 2016

1   COURSE CONTACT

○ Class Meetings: M W 8:30AM – 9:55AM, EB J15

○ Instructor: Dr. Sung H. Chung
  – E-mail: schung@binghamton.edu
  – Office: EB S03
  – Office hours: T R 10:00AM – 11:00AM, or by appointments

○ TA: TBA

2   TEXTBOOK

○ Introduction to Probability Models, 11th edition, by Sheldon M. Ross, Academic Press

3   COURSE INFORMATION

Course Coverage: Some stochastic models used in mathematics and operations research such as discrete-time Markov chains, Poisson processes, birth and death processes and other continuous Markov chains, and renewal reward processes will be covered. Application areas include queuing, reliability, manufacturing, inventory, biology, insurance risk and finance.

Expectations for Work Outside of Class: This is a 3 credit course. Students are expected to spend at least 9 hours/week outside of class to do their homework assignments, and prepare for quizzes and exams.

Student Learning Outcomes: After successfully completing the course, students should be able to do the following:

1. Have basic knowledge about stochastic processes in the time domain.

2. Acquire more detailed knowledge about Markov processes with a discrete state state space, including Markov chains, Poisson processes and birth and death processes.

3. Know about queueing systems and Brownian motion, in addition to mastering the fundamental principles of simulation of stochastic processes and the construction of Markov chain Monte Carlo (MCMC) algorithms.

4. Formulate simple stochastic process models in the time domain and provide qualitative and quantitative analyses of such models.

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4   Project

During the last few weeks of the course we will focus on a final project in which you will put the pieces of the course together to complete a stochastic process study. The final project will be done in small groups of two or three. In this project, your group will select a problem, develop a model, implement the model, analyze the output, and prepare a report and presentation on the results.

5   Homework Assignments, Quizzes, and Exams

Homework Assignments: There will be 7 to 9 assignments. While students are welcome to discuss homework problems with colleague students, each student must hand in his or her **own write-up**. An assignment is only considered for credit if it satisfies ALL of the following:

- It is handed in on time.
- It is legible, and has the problems numbered and in order.
- It has your name and section on the top right corner of the front page.
- It is stapled together at the top left corner.

No late submission accepted.

Quizzes: There will be 4 to 6 quizzes during the regular class hours. Quizzes may not be announced. *Absolutely no make-ups. No exceptions.*

Exams: There will be one mid term exam and one final exam, each being cumulative with a focus on recent materials.

6   Grading

The grading will be determined as follows:
- Assignments: 20% for all assignments (The lowest two will be dropped at the end of the semester.)
- Project: 20%
- Midterm Exam: 20% (Tentatively scheduled on March 22nd (Tue.), in class)
- Final Exam: 30% (Final examinations week)
- Attendance: 10%
- Quizzes: bonus points.

7   Explain Your Answers

When writing up your solutions for homeworks, quizzes, and exams, you must always explain your answers. Show all reasonable steps and also comments on the result. It is your responsibility to convince the grader that you understand how to solve the problem. If you just give the answer without explanation, then you receive no points.

8   Course Policy

○ Students are expected to check his or her email frequently, at least once a day, especially before the class day. Important announcements including homework assignments will be made via emails.
○ Don't be late to the class. It is your responsibility for being a college student. The door will be locked at 8:35am.
○ *Absolutely no make-ups for quizzes under ANY circumstances.*
○ Exams must be taken on the dates scheduled. Unless there is a medical emergency, make-up exams will not be given. *Proof will be required.*
○ No cheating allowed. If you do, you will not receive a grade higher than 'F'.
○ Turn in your assignments on the due date *on or before class starts*. *No late submission accepted*.
○ There is a simple but very important rule in learning: keep asking questions to yourself. The instructor and TA will help you.

9   Academic Honesty and Integrity

Academic integrity is of considerable importance as you continue in college and in your professional life. I expect and demand honesty. Ethical behavior is expected at all times. The expression of this responsibility in this class includes, but is not limited to, handing in your own work, not plagiarizing work of others, and working responsibly with your teammates. Anyone caught not acting ethically will receive a grade of 'F' for the entire semester.

10   Examples of Academic Dishonesty

Academic dishonesty includes, but is not limited to, the following:
- *Previously submitted work.* Submitting academically required material that has been previously submitted in whole or in substantial part in another course, without prior and expressed consent of the instructor.
- *Plagiarism.* Copying or receiving material from any source and submitting that material as one's own, without acknowledging and citing the particular debts to the source (quotations, paraphrases, basic ideas), or in any other manner representing the work of another as one's own.
- *Cheating.* Soliciting and/or receiving information from, or providing information to, another student or any other unauthorized source (including electronic sources such as cellular phones and PDAs), with the intent to deceive while completing an examination or individual assignment.
- *Falsification of academic materials.* Fabricating laboratory materials, notes, reports, or any forms of computer data; forging an instructors name or initials; resubmitting an examination or assignment for reevaluation which has been altered without the instructors authorization; or submitting a report, paper, materials, computer data, or examination (or any considerable part thereof) prepared by any person other than the student responsible for the assignment.
- *Misrepresentation of documents.* Forgery, alteration, or misuse of any University or Official document, record, or instrument of identification.

- *Confidential academic materials.* Procurement, distribution or acceptance of examinations or laboratory results without prior and expressed consent of the instructor.
- *Selling academic assignments.* No person shall sell or offer for sale to any person any academic assignment, or any inappropriate assistance in the preparation, research, or writing of any assignment, which the seller knows, or has reason to believe, is intended for submission in fulfillment of any course or academic program requirement.
- *Purchasing academic assignments.* No person shall purchase an academic assignment intended for submission in fulfillment of any course or academic program requirement.

11   Professional Conduct

- All students are expected to practice and display a high level of personal and professional integrity.
- Any minor unprofessional behavior to instructor, teaching assistants, or course assistants will result in a 10% reduction of your final score per occurrence.
- Any major unprofessional behavior to instructor, teaching assistants, or course assistants will result in a failing grade 'F' and a hearing before the Watson School Academic Integrity Committee and could result in dismissal from the University.
- Each student is responsible for obtaining the information presented in lectures.
- Silence all electronic devices (phones, Palms, Pocket-PC's, iPods, pagers, etc.) during classes. Use of earphones is not allowed during classes.
- Disturbance of class by electronic devices will result in a 5% reduction of your final score per occurrence.
- All laptops should be closed during lecture unless instructed otherwise.
- No smart phones allowed in quizzes and exams.

12   Disability Services

If you have a disability and may require some type of instructional and/or examination accommodation, please inform me early in the semester so that we can coordinate the accommodations you may need. If you have not already done so, please contact the Student Disability Services office. The office is located at University Uniton, Room 119 and the telephone number is (607) 777-2686. The website is at: http://www.binghamton.edu/ssd/