

Clemson University
Department of Industrial Engineering
IE 8880

Course Title : Advanced Probabilistic Methods
Class Meetings : MWF, 10:10 – 11:00
Classroom : Freeman Hall 129

Instructor : Burak Eksioglu
Office : Freeman 272
Phone : (864) 656-0111
E-mail : burak@clemson.edu
Office Hours : MW, 11:00 – 12:30 (or by appointment)

Policies:

1. **Waiting:** If nobody shows up to instruct class within 10 minutes of the start of class, students may leave.
2. **Attendance:** I will not take attendance. However, if you miss a class you are responsible to make sure that you are aware of what was discussed in class.
3. **Disability:** Students with disabilities needing accommodations should contact the Office of Student Disability Services in Suite 239, Academic Success Center building 864-656-6848, to discuss specific needs within the first month of classes.
4. **Discrimination:** “Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran’s status, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in any complaint process, etc.) in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972.” (<http://www.clemson.edu/campus-life/campus-services/access/non-discrimination-policy.html>) Jerry Knighton is the Director of Access & Equity and the University Title IX Coordinator. He can be reached at (864) 656-3184 or at knightl@clemson.edu.
5. **Integrity:** “As members of the Clemson University community, we have inherited Thomas Green Clemson’s vision of this institution as a ‘high seminary of learning.’ Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form. In instances where academic standards may have been compromised, Clemson University has a responsibility to respond appropriately to charges of violations of academic integrity.” (<http://gradspace.editme.com/AcademicGrievancePolicyandProcedures#integritypolicy>)

Text: “A First Course in Stochastic Models,” by Henk C. Tijms, Wiley, 2003.

Prerequisites: IE 8090 (or equivalent)

Catalog Description: This is an advanced course in stochastic processes for students who have had some introductory level course on the topic. The course goes into detailed analysis of various stochastic processes such as the Poisson process, renewal reward process, discrete-time and continuous-time Markov chains as well as discrete-time Markov decision processes.

Course Objectives and Outcomes:

Students completing this course will be able to:

- Model real-life engineering problems as stochastic processes.
- Perform theoretical analysis of stochastic processes such as the Poisson process, the renewal-reward process, Markov processes, and queuing systems.
- Implement algorithms such as the policy iteration and value iteration algorithms to solve engineering problems that can be modeled as Markov Decision Processes.

Topical Outline: 3 weeks, The Poisson Process
 3 weeks, Renewal Reward Processes
 1 week, Discrete-Time Markov Chains
 3 weeks, Continuous-Time Markov Chains
 3 weeks, Markov Chains and Queues
 1 week, Discrete-Time Markov Decision Processes
 1 week, Tests

Examinations: There will be two exams (a midterm and a final). Each exam will comprise 20% of your total score. All exams are closed book and closed notes, but you are allowed to bring a formula sheet and a calculator (not a computer) to the exams. A formula sheet is a standard (8.5” by 11”) printer paper on which you can write anything.

Midterm Exam – **March 13**

Final Exam – Tuesday, **April 30** at **3pm**

Assignments: I expect to give about three assignments throughout the semester. These will comprise 60% of your total score. Late assignments will not be accepted.

Course Assessment:

Grade distribution:

Assignments – 60% (20% each)

Midterm Exam – 20%

Final Exam – 20%

Letter grades will be given as follows:

A: [90-100] B: [80-90) C: [70-80) F: Below 70.

Grades will be posted on the course web site. It is your responsibility to verify that your grades have been correctly entered. You have **one week** after an assignment or a test is returned to discuss changes in your grade.