

## ISEN 602 – Applications of Random Processes<sup>1</sup>

Richard M. Feldman

Room 4011 ETD (845-5585)

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MW 8:00 AM – 9:15 AM

**Recommended Text:** S. M. Ross (1996). *Stochastic Processes*, Second Edition, John Wiley and Sons.

**Reference:** R. M. Feldman and C. Valdez-Flores (2010). *Applied Probability and Stochastic Processes*, Second Edition, Springer-Verlag.

E. Cinlar (1975). *Introduction to Stochastic Processes*, Prentice-Hall, Inc.

**Catalog Description:** Introduction to probability and random processes as a basis for studying topics in industrial engineering and operations research.

**Objectives:** This course will provide students with theoretical foundations as well as applications of probability and random processes that are frequently encountered in engineering systems. In particular, the course would equip students with tools for modeling, analysis, design and control of stochastic system.

**Prerequisites:** ISEN 609 and either STAT 212 or STAT 601. Familiarity with Excel will also be assumed. Previous exposure to Markov chains and Markov processes is assumed; therefore, **you may not take the course without ISEN 609.**

**Course Topics:** (Length of topic coverage is approximate)

Review of probability, conditional probabilities (1 week)

Poisson processes (1 week)

Discrete time Markov Chains (2 weeks)

EXAM. Tentatively February 19

Continuous time Markov Processes (2 weeks)

Renewal Processes (3 weeks)

EXAM. Tentatively March 25

Markov Renewal Processes (3 weeks)

Markov Decision Theory (2 weeks)

EXAM. Tentatively April 22

FINAL (*optional*) Thursday, April 30 at 10:00 AM

**Major Exams:** There are three exams and an optional final exam (April 30). Make a note of the exam dates on your calendar because a job interview on an exam date is **not** an excused absence without documentation that the interview is for a full-time position and is on a date that cannot be rescheduled. If a test is missed, you *must* have a written authorized excuse. If you miss class for a medical reason, you must have some documentation from a *health care professional*. According to student rules, “an absence for a non-acute medical service does not constitute an excused absence”. If you have a simple note from Student Health Services only indicating that you had an appointment, I will assume that it is for a non-acute medical service. If you visited Health Services due to a serious or contagious condition, you should provide me with a medical confirmation. You should also be aware that the Student Health Service does **not** provide notes retroactively. If possible, please let me know before the test if you expect to miss a test due to a planned activity that is university excused; otherwise, I must be notified within two days of your return to school. Any disagreements regarding a grade received on any graded material must be discussed within one week of the return of the graded material. *No grade will be changed beyond the one week limit.*

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<sup>1</sup> This syllabus is subject to change any time before January 13, 2020.

**Office Hours Policy:** I am usually in my office most mornings from 9:30AM to 11:00AM, MWF. You do not need an appointment to see me. If you are in the area and you have questions (or just want to talk) feel free to check and see if I am in, morning or afternoon. I will be glad to discuss anything with you *except* material covered during an unexcused absence.

**Homework:** Homework will be assigned on most class days and must be submitted in eCampus by 7AM on the morning of the next class period immediately following the assignment. When submitting answers to eCampus, it is very important to following rounding instructions. Late assignments are not accepted and if you must submit the assignment by email, you will only receive half credit for the assignment.

**Class Attendance:** Class attendance is not optional. You are expected to attend all class lectures except for university excused absences. *With an excused absence, it is still the student's responsibility to find out the homework assignment.* The university rule regarding excused absences can be found at <http://student-rules.tamu.edu/rule07>. **Reminder: a job interview is not an excused absence on a test day. An exception to this is made if you have documentation indicating that the interview cannot be rescheduled and is for a full time job.**

**Grade:** If you do not take the final, each test is 30% of your grade and the combined homework grade counts as 10%. If you take the final, each test is 22.5%, the combined homework is 7.5%, and the final exam is 25% of your grade. Grades assigned are A for 90%–100%, B for 80%–89.9%, C for 70%–79.9%, D for 60%–69.9% and F for less than 60%. Without the final, grades are truncated; otherwise they are rounded; thus, 89.99% is a B if the final exam is not taken. At the end of the semester when you plead for a better grade based on how hard you worked or on what you need in order to graduate or to accept an internship; remember – grades are based on performance and not on what you need or how hard you worked. There will be no “extra” assignments available for improving your grade. Grades will be maintained online at <http://eCampus.tamu.edu>

**Communication:** I try to respond to email questions about class work frequently; however, *you should always use your TAMU email account* so that my spam filter does not block your question. (I also do not check university email on Sunday.) Files for classwork, homework, and tests are maintained on

S: ➔ ISEN ➔ Classes ➔ ISEN-602 ➔ Class.

**Academic Integrity:** “An Aggie does not lie, cheat, or steal or tolerate those who do.” It is the responsibility of students and instructors to help maintain scholastic integrity at the university by refusing to participate in or tolerate scholastic dishonesty. (See the web site <http://aggiehonor.tamu.edu> for the Honor Council Rules and Procedures.)

In this course, I will request the Aggie Honor Office to assign a grade of F\* for any violation of the Aggie Honor Code, no matter how minimal the violation may be. (The Honor Council Rules and Procedures can be found at <http://aggiehonor.tamu.edu>.)

**The Americans with Disabilities Act (ADA).** Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit <http://disability.tamu.edu>. Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

**Special Dates:**

First lecture: Monday, Jan 13  
Holiday, Martin Luther King, Jr. Day, no classes: Monday, Jan 20  
Test 1: Tentatively, Wed, Feb 19  
Spring Break: Mon – Fri, Mar 9 – 13  
Test 2: Tentatively, Wed, Mar 25  
Last day Q-Drop: Tuesday, Apr 14  
Test 3: Tentatively, Wed, Apr 22  
Final lecture: Monday, Apr 27

Optional Final: Thursday, April 30, 10:00 AM – noon