Fall 2015 - EE 351K – Prof. Sujay Sanghavi

Probability, Statistics, and Random Processes

Personnel

Instructor: Prof. Sujay Sanghavi, UTA 7.208, sanghavi@mail.utexas.edu

Teaching Assistant: Yanyao Shen shenyanyao@utexas.edu

Description

This course is an introduction to probability, statistics and random processes for engineers. Topics to be covered include:

Probability models and axioms, conditional probability, Bayes' rule, independence and counting.Discrete and continuous random variables, expectations, conditioning and joint distributions Derived distributions, covariance, conditional expectation, Inequalities, weak law of large numbers and central limit theorems and their applications Bayesian and classical statistical inference: maximum aposteriori rule, least mean square error estimation, linear least square estimation, parameter estimation, linear regression and binary hypothesis testing, and (time permitting) Bernoulli process and discrete time Markov chains.

Throughout the course we will describe various applications of these concepts that electrical engineers might encounter, such as process control, system reliability, noise models and communications. Emphasis will be placed on developing your intuition for probabilistic notions and dealing with uncertainty in design.

Prerequisite

EE313 with a grade of C or better.

Required text

Introduction to Probability, Dimitri Bertsekas and John Tsitsiklis, 2008. (Second Edition)

Other helpful (not required) texts:

Probability and Stochastic Processes, Roy D. Yates and David J. Goodman, John Wiley

and Sons, Second Edition, 2005.*Introduction to Probability, and Statistics for Engineers and Scientists,* Sheldon Ross, John Wiley, 1987.

Probability and Random Processes for Electrical Engineering, Alberto Leon-Garcia, Addison- Wesley, 1994.

Meeting times and Locations

Classes will be held Tuesdays and Thursdays 9:30 - 11:00am in SZB 296

Instructor Office Hours are 11:00am – noon (i.e. immediately after class) on Tuesdays in UTA 7.208

TA Office Hours are TBD

Course web pages

The class will primarily use the Canvas system for online content. This includes homeworks, their solutions, practice problems and exams, syllabus and any other content. You can access it by logging in to Canvas at http://canvas.utexas.edu You need a UT-EID and password and must be registered for the course to access the system. It is your responsibility to check for homework assignments each week.

Homeworks

Homeworks will be assigned weekly on Canvas. It is your responsibility to check for homework assignments each week. The homeworks will be due on **Thursdays** in class, **BEFORE** the class starts. You are expected to make an independent attempt to solve and turn in your answers to each homework question.

Late homework will be awarded a grade of zero unless permission is sought in advance to turn in late and is based on a valid reason **such as a medical emergency (with doctor note).**

Mid-term and finals

There will be two midterms and a final. The midterms will be in class. The final will be given at the time scheduled by the university registrar. Please make sure you can take the final at the appointed time otherwise you should take a different section.

Dates for midterms and final:

Midterm 1: October 1, 2015 in class

Midterm 2: November 10, 2015 in class

Final: TBD

No make-up exams will be given. An excused absence from a midterm exam must be obtained in **advance.** In this case the student's final exam grade will be substituted for the missed exam. In the case of an excused absence from the final exam, the course grade will be based on the homework and midterm exams. Unexcused absences from a midterm or final will result in a grade of zero for that exam. Note that excused absences from exams will be made only in extreme circumstances (serious illness, death in the immediate family, etc.). Requests for excused absences should be made in writing and must be supported by appropriate documentation.

In-class Short Quizzes

Every week, on Thursday, we will have a short (10-15min) quiz. It will be based on 1 or 2 problems that are based on similar material as (but may **not** be exactly the same as) problems in the homework that has just been turned in at the beginning of class.

For grading, the three lowest grades of the semester in these short quizzes will be dropped. Correspondingly, there will be NO makeups given; a missed / not turned in quiz will earn a grade of 0 for that quiz.

If there is a midterm during the Thursday class, there (of course) will be no quiz on that day.

Grading policy

The final grade will be a weighted average of your homework, mid-term, and final scores. The weightings are:

In-class short quizzes: 10%

Homeworks: 10%

Mid-term 1: 20%

Mid-term 2: 20%

Final: 40%

Academic dishonesty and policies on cheating

Faculty in the ECE Department are committed to detecting and punishing all instances of academic dishonesty and will pursue cases of academic dishonesty in accordance with universitypolicy. Academic dishonesty, in all its forms, is blight on our entire academic community. All parties in our community – professors, staff, and students – are responsible for creating an environment that educates outstanding engineers, and this goal entails excellence in technical skills, self-giving citizenry, and ethical integrity. Industry wants engineers who are competent and fully trustworthy, and both qualities must be developed day by day throughout an entire lifetime.

Details about what constitutes academic dishonesty can be found at the following URL: UT Dean of Students Office (http://www.utexas.edu/depts/dos/sjs/academicintegrity.html).

All cheating will be reported directly to the college/university. Unless explicitly indicated in an assignment, you must do your homeworks, projects and exams individually. You are welcome and encouraged to discuss material with your colleagues, when and where it is appropriate, but copying, stealing papers, etc. are considered dishonest and will be prosecuted.

Notes:

Allegations of Scholastic Dishonesty will be dealt with according to the procedures outlined in Appendix C, Chapter 11, of the General Information Bulletin, http://www.utexas.edu/student/registrar /catalogs/.

The University of Texas at Austin provides, upon request, appropriate academic adjustments for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4241 TDD or the College of Engineering Director of Students with Disabilities at 471-4321.