



Sirindhorn International Institute of Technology

Thammasat University

School of Information, Computer and Communication Technology

ECS 315: Course Syllabus

Semester/Year: 1/2012

Course Title: Probability and Random Processes

Instructor: Dr. Prapun Suksompong (prapun@siit.tu.ac.th)

Course Web Site: <http://www2.siiit.tu.ac.th/prapun/ecs315/>

Please check the course web site regularly for updated information about this course.

Lectures

Time and Place:

- Tuesday 13:00-14:20 BKD 3206
- Thursday 10:40-12:00 BKD 3206

You are **STRONGLY** encouraged to attend lectures. (See the grading policy below.)

Undergraduate Student Dress Code:

- Undergraduate students must wear Thammasat University uniform OR polite dress.
- Plain white shirt, properly tucked in.
- Plain trouser/skirt in dark color.
- The followings are not allowed:
 - Sandals
 - T-shirt (even with the shop shirt)
 - Polo-shirt (even with the shop shirt)

Prerequisite: MAS 117 or consent of Head of School

Course Description: This course introduces the principles of probability and random processes to undergraduate students in electronics and communication. The topics to be covered include random experiments, events, probability, discrete and continuous random variables, probability density function, cumulative distribution function, functions of random variables, expectations, law of large numbers, central limit theorem, introduction to random processes, Gaussian random process, autocorrelation and power spectral density.

Textbook: R. D. Yates and D. J. Goodman, Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers, 2nd ed., Wiley, 2004. Call No. QA273 Y384 2005.

References:

1. John A. Gubner. Probability and Random Processes for Electrical and Computer Engineers. Cambridge University Press, 2006.
2. Terrence L. Fine. Probability and Probabilistic Reasoning for Electrical Engineering. Prentice Hall, 2005. Call No. QA273 F477 2006
3. William Feller. An Introduction to Probability Theory and Its Applications, Volume 1. Wiley, 3 edition, 1968.
4. Probability and random processes for electrical engineering / Alberto Leon-Garcia. Call No. TK153 L425 1994
5. A first course in probability / Sheldon Ross. Call No. QA273 R83 2002
6. Probability models, introduction to / Sheldon M. Ross. Call No. QA273 R84 1997
7. Leonard Mlodinow. The Drunkard's Walk: How Randomness Rules Our Lives. Pantheon; 8th Printing edition, 2008.
8. Peter Olofsson. Probabilities: The Little Numbers That Rule Our Lives. Wiley, 2006.
9. Henk Tijms. Understanding Probability: Chance Rules in Everyday Life. Cambridge University Press, 2 edition, August 2007.

Grading Policy: Coursework will be weighted as follows:

Assignments	5%
Quiz	5%
Class Discussion/Participation	10%
Midterm Examination	40%
Final Examination (comprehensive)	40%

- No late assignments will be accepted.
- Cheating will not be tolerated
- Copying homework/quiz/exam = cheating
 - Punishment:
 - First time cheater receives zero on that assignment
 - Second time cheater receives zero on all quizzes and/or HWs

Assignments: Homework will be assigned throughout the semester. For each assignment, only part(s) of a selected problem will be graded. Of course, you do not know which problem will be selected; so you should work on all of them. The complete solutions to all problems will be posted on the course web site.

Quizzes and Exams:

Exams will be closed book.

Quizzes will test current and previous topics. A quiz may be given at any time during any class period – at the beginning or end of a class, etc. There will be no make-up quizzes. Quizzes will be given only to those students who are present when the quizzes are passed out.

Students should notify the instructor before missing any exam if at all possible and immediately thereafter when not possible. The instructor (and/or the fact-finding committee) will determine if the absence from an exam is legitimate. Simply not feeling well is not a reason to miss an exam. In the case of legitimate absence, an oral and/or written make-up exam could be arranged.

Expectations: You should expect to spend extra 5-8 hours per week studying outside of class. However, I do expect you to come to class and participate actively in class discussions. If you must miss a class, I expect you to find out and catch up with what happened in lecture, either from me or one of your classmates. You are responsible for all materials that are discussed in class.

Academic Integrity

The work you submit in ECS 315 is expected to be the result of your individual effort. You are free to discuss course material, approaches to problems with your colleagues or the instructor but you should never misrepresent someone else's work as your own.

It is your responsibility to protect your work from unauthorized access. For example, do not discard copies of your codes/assignments in public places.

Course Outline

The following is a tentative list of topics with their corresponding chapters from the textbook by Yates and Goodman. Each topic spans approximately one week.

1. Introduction, Set Theory, Classical Probability [1]
2. Counting Methods and Combinatorics [1]
3. Probability Foundations [1]
4. Discrete Random Variable [2]
5. Real-Valued Functions of a Random Variable [2]
6. Expectation, Moment, Variance, Standard Deviation [2]
7. Multiple Random Variables [4, 5]
8. **MIDTERM: 14 Aug 2012 TIME 13:30 - 16:30**
9. Function of Multiple Random Variables [4, 6]
10. Continuous Random Variables [3-6]
11. Mixed Random Variables [3]
12. Conditional Probability: Conditioning by a Random Variable [4]
13. Transform methods [6]
14. Limiting Theorems [6, 7]
15. Random processes, Poisson Processes, Cross-correlation, Power spectral density [5, 10, 11]
16. **FINAL: 18 Oct 2012 TIME 13:30 - 16:30**

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