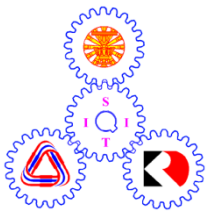

Sirindhorn International Institute of Technology
Thammasat University

School of Information, Computer and Communication Technology

ECS315: Course Syllabus

Semester/Year: 1/2016

Course Title: Probability and Random Processes
Instructor: Asst. Prof. Dr.Prapun Suksompong (prapun@siit.tu.ac.th)
***Course Website*:** http://www2.siit.tu.ac.th/prapun/ecs315/

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

Lectures

- Wednesday 10:40-12:00 BKD 3510
- Thursday 14:40-16:00 BKD 3510
- Friday 09:00-10:20 BKD 3510 (Tutorial/Quiz/Make-up; Shared with ECS332)

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

Course Information

Prerequisite: MAS117 (Mathematics II: Multivariable Calculus)

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: [Y&G] 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.

Additional 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. Henk Tijms. Understanding Probability: Chance Rules in Everyday Life. Cambridge University Press, 3rd edition, 2012. Call No. QA273 T48 2012
4. William Feller. An Introduction to Probability Theory and Its Applications, Volume 1. Wiley, 3 edition, 1968.
5. Probability and random processes for electrical engineering / Alberto Leon-Garcia. Call No. TK153 L425 1994
6. A first course in probability / Sheldon Ross. Call No. QA273 R83 2002
7. Probability models, introduction to / Sheldon M. Ross. Call No. QA273 R84 1997
8. Leonard Mlodinow. The Drunkard's Walk: How Randomness Rules Our Lives. Pantheon; 8th Printing edition, 2008.

Grading Policy: Coursework will be weighted as follows:

Assignments (HWs)	5%
In-Class Exercises	5%
Class Discussion/Participation	10%
Midterm Examination	40%
Final Examination (comprehensive)	40%

- Late assignments will be heavily penalized or rejected.
- The lowest in-class exercise score will be dropped.
  Similarly, the lowest assignment score will be dropped.
- Cheating will not be tolerated

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 (not just answers) will be posted on the course web site.

In-Class Exercises: In-class exercises will focus on current and previous topics. An exercise may be given at any time during any class period. Students are expected to work in groups of four persons. In-class exercises will be given only to those students who are present when the in-class exercises are distributed. There will be no make-up exercise. Tutorial slot(s) can also be used for pre-announced exercise(s).

Exams: An A4 study sheet is allowed. One side for the midterm exam. Another side for the final exam.

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 this class 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.	Event-based Independence, Conditional Probability	[1]
5.	Discrete Random Variable	[2]
6.	Real-Valued Functions of a Random Variable	[2]
7.	Expectation, Moment, Variance, Standard Deviation	[2]
8.	**MIDTERM: 13 Oct 2016 TIME 13:30 - 16:30**	
9.	Continuous Random Variables	[3-6]
10.	Families of Continuous Random Variables	[3]
11.	Multiple Discrete Random Variables	[4, 6]
12.	Multiple Continuous Random Variables	[4, 5]
13.	Conditioning by a Random Variable	[4]
14.	Limiting Theorems	[6, 7]
15.	Transform Methods	[7]
16.	Mixed Random Variables, Random Vectors, Random processes, Poisson Processes, Power Spectral Density	[3, 5, 10, 11]
17.	**FINAL: 22 Dec 2016 TIME 13:30 - 16:30**	

Additional Remarks

1) Calculator: Casio FX-991 is permitted in exams and for in-class exercises
2) MATLAB: Computer simulation will be used to enhance learning. MATLAB is available in SIIT computer labs.

Last updated: 8/13/2016 8:45 PM