بسم الله الرحمن الرحيم

King Saud University
College of Computer and Information Sciences
Department of Computer Engineering

جامعة الملك سعود
King Saud University

CEN 343- INTRODUCTION TO RANDOM PROCESSES 3 (3,0,1)
Semester I, Academic Year 2016-2017
Required Course: Time SMW 2:00-2:50
Course Website: http://teaching.alsir.com/cen343

1. Course number and name: **CEN 343, Introduction to Random Processes**

2. Credits and contact hours: **3 (3, 0, 1)**

3. Instructor's or course coordinator's name: Haikel Hichri

4. Text book, title, author, and year:

Random Variables and Random Signal Processing, Peebles, P., Probability, 4th Ed., 2001, McGraw Hill.

a. Other supplemental materials:

Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers, Yates, R. D. and Goodman, D. J., 2nd Ed., 2005 John Wiley and Sons

*Statistic Informed Decisions Using Data***,** Sullivan III, M., 3rd Edition, 2010, Pearson.

5. Specific course information

a. Course description (catalog)

Covers probability theory, random variables, descriptive statistics, random sampling, statistical intervals and hypothesis testing for a single sample, stochastic processes, spectral characteristics and applications to systems.

b. prerequisites or co-requisites: CEN 340 (co-requisite).

c. Required, elective, or selected elective course: Required.

6. Specific goals for the course

a. Course Learning Outcomes: This course requires the student to demonstrate the following

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1. Explain basic concepts probability, joint probability, conditional probability, independence, total probability, and Bayes' rule.
2. Define single random variables in terms of their PDF and CDF, and calculate moments such as the mean and variance.
3. Define multiple random variables in terms of their PDF and CDF and calculate joint moments such as the correlation and covariance.
4. Explain random sampling and data description.
5. Define important properties of point estimators and construct point estimators using maximum likelihood.
6. Estimate the value of a parameter using confidence intervals.
7. Explain basic concepts of a random process, calculate the mean, variance, autocorrelation, and power spectral density of a stationary random process.

b. Relationship of Course to Student Outcomes

Outcome	Student Outcome Description	Contribution
(a)	an ability to apply knowledge of mathematics, science, and engineering	√
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	√
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	√
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	

7. Brief list of topics to be covered and schedule in weeks

Set theory and probability basics	2
One dimensional random variables	2
Two dimensional random variables	2
Statistics	4
Stochastic processes and spectral characteristics	4
Review and evaluation	1

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Course Policies:

- All homework assignments are due on due date, any delay will cost 20% per week.
- **Attendance in the lecture is a must.** Students failed to achieve more than 75% attendance will be reported to the concerned authority; excuse should be directly submitted to the professor; excuses of absence are accepted no later than one week of the absence.
- **All the exams are closed book.**
- **Cheating or plagiarism in any form will not be tolerated. A grade of zero will be registered for any infraction.**
- I am always open for your comments, suggestion, complaint, etc.

Assessment Plan for the Course

Student's performance in homework, quizzes, and exams.

Tutorials/quizzes/homework	20%
Two Midterm exams	40%
Final exam	40%

THE FINAL EXAM WILL BE COMPREHENSIVE.

Current Instructor, Department, Office Hours and Date:

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