



King Saud University

College of Computer and Information Sciences

Department of Computer Engineering

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: Dr. R. HEDJAR

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

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

Statistics: Informed Decisions Using Data, Sullivan III, M., 3rd Edition, 2010, Pearson.

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

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

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

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

8. Assessment Plan for the Course

Quizzes	5%
HWs	15%
Midterm Exams (2)	40%
Final Exam	40%
Total	100%

Midterm exam dates:

Midterm: October 11, 2018.

Midterm 2: November 22, 2018

Course Policies:

- Cheating or plagiarism in any form will not be tolerated. A grade of zero will be registered for any infraction.
- **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 concerned authority; excuses of absence are accepted no later than one week of the absence.
- **All the exams are closed book.**

Current Instructors, Department, Office Hours and Date:

Dr. R. HEDJAR

Department of Computer Engineering

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Thursady2:00 PM-3:00 PMand by
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