KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
ELECTRICAL ENGINEERING DEPARTMENT
EE 315 -Probabilistic Methods in Electrical Engineering
Tentative Course Syllabus (071)

Instructor: Dr. Alakhdhar, S. Zaki   **Office:** 59/1086   **Phone:** 2360,   **E-mail:** zakiha@kfupm.edu.sa
Office Hours: SMW 12:00-1:00PM,   Web Site: WebCT

PREREQUISITE: EE 207

TEXT BOOK: Peebles, P. Z. "*Probability, Random Variables, and Random Signal Principles* ", McGraw -Hill, 4th Edition, 2001.

REFERENCE:
Leon-Garcia, A. "Probability and Random Processes for EE", Addison Wesley, 2nd Edition, 1994.
Ross, S. . "A First Course in Probability", Prentice Hall, Fifth Edition, 1998.
Helstrom, C.W. "Probability and Stochastic Processes for Engineers", Addison-Wesley, 2nd Edition, 1992.
Walpole, R.E., Myers, R.H. and Myers, S. L., "Probability and Statistics for Engineers and Scientists", Prentice Hall, Sixth Edition, 1998.Leon-Garcia, A. " *Probability and Random Processes for EE*", Addison Wesley, 2nd Edition, 1994.

Week	Topics	Sections	Homework
1	**Probability** Set definitions and set operations Axioms of probability	 1.1-1.2 1.3	see table below
2	Joint and conditional probability Independent events Combined experiments	1.4 1.5 1.6	
3	Bernoulli trials **Random Variables** The random variable (r.v.) concept CDF	1.7 2.1 2.2	
4	PDF Some Important r. v.'s	2.3 2.4	
5	Some Important r. v.'s Conditional distribution and density functions	2.5 2.6	
6	Expectation Moments	3.1 3.2	
7	Characteristic function Transformations of a r.v.	3.3 3.4	
8	**Multiple random variables** Pairs of r.v.'s Properties of joint distribution and joint density	4.1 4.2-4.3	
9	Conditional distribution and density Statistical Independence Distribution and density of a sum of r.v.'s Central Limit Theorem	4.4 4.5 4.6 4.7	
10	Expected value of a function of r. v.'s Joint characteristic functions Jointly Gaussian r. v.'s	5.1 5.2 5.3 (Only 2 r.v.'s)	
11	Transformations of multiple r.v.'s Sampling and some limit theorems **Random Processes –Temporal Characteristics** Concept of a random process Stationarity and independence	5.4 5.7 6.1 6.2	
12	Correlation functions and their properties Gaussian random process Poisson random process	6.3-6.4 6.5 6.6 (Up to (6.6-4))	
13	**Random Processes – Spectral Characteristic** Power Spectral Density and its properties Relationship between PSD and autocorrelation function	7.1 (Up to (7.1-21)) 7.2	
14	**Linear systems with random inputs** Random signal response of linear systems Spectral characteristics of system response	8.2-8.4	
15	**REVIEW**		

GRADING POLICY:

Assignments and Class work 25%	Major Exam I (November 6, 2007 6:30-8:30 PM) 15%	Major Exam II (December 3, 2007 6:30-8:30 PM) 25%	Final Exam Comprehensive 35%

- **Official excuses** have to be verified from Students' Affairs and must be submitted no later than one week from the absence .The instructor may not accept late excuses. Personal excuses will not be accepted. According to the university regulations, any student that exceeds 20% of the scheduled class meetings without an official excuse will receive a grade of DN in the course.

- **Practice problems** will be assigned weekly on WebCT. Each student is responsible to solve them independently. Solutions will be posted on WebCT.

- **Quizzes**: 6-7 popup quizzes. **Expect a popup quiz** every Wednesday on the covered material. Be prepared. Quizzes **may be** based on the practice problems.
- **No make up of quizzes nor exams**.

Homework # 1	1.1-5, 1.2-3, 1.3-7, 1.3-11, 1.3-13, 1.4-5, 1.4-9, 1.4-10, 1.4-13, 1.5-5, 1.7-2, 1.7-4
Homework # 2	2.1-1, 2.1-11, 2.2-3, 2.2-5, 2.3-2, 2.3-8, 2.3-9, 2.4-1, 2.4-7, 2.4-11, 2.4-14, 2.4-16, 2.5-3, 2.5-6, 2.6-4
Homework # 3	3.1-1, 3.1-11, 3.1-14, 3.1-15, 3.2-3, 3.2-11, 3.2-24, 3.3-5, 3.4-2, 3.4-4, 3.4-10
Homework # 4	4.2-10, 4.2-11, 4.3-8, 4.3-10, 4.4-2, 4.5-7, 4.6-10, 4.6-13
Homework # 5	5.1-1, 5.1-6, 5.1-12, 5.1-18, 5.1-35, 5.3-1, 5.3-4, 5.3-8
Homework # 6	6.3-1a, b, and c only, 6.3-2, 6.3-3, 6.3-4, 6.3-8
Homework # 7	7.1-12, 7.1-16, 7.1-22, 7.2-3, 7.2-10
Homework # 8	8.2-20, 8.4-8, 8.4-9, 8.4-11