



Hashemite University
College of Engineering
Department of Electrical Engineering
EE 321-probability and random processes (3 Credit Hours/Dept. Compl.)

Instructor

Grading info

Class Info

Dr. Ali Hayajneh	
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Office:	E 3097
Office hours:	

First	30%
Second	30%
Final	40%

Days	
Time	
Location	

Course

Course Number:	110409322
Prerequisite:	Applied math (110406260), covering the following topics: <ul style="list-style-type: none"> - Complex numbers analysis. - Linear algebra. - Laplace transform. - Integration techniques.
Textbook	“probability, random variables, and random signal principles” , 4th edition, Peyton peeples, McGraw Hill, 2001.
Course Description	Probability axioms, random variables, operations on one random variable, multiple random variables, operations on multiple random variables, random processes.
Specific Outcomes of Instruction (Course Learning Outcomes)	The student should be able to <ol style="list-style-type: none"> 1. Carry out basic calculations for probability.(e) 2. Use density and distribution functions to calculate the probability for various problems.(a,e) 3. Perform operations such as expectations, variance, and transformation on random variables, characteristic functions.(a,e) 4. Carry out calculations of probability related to vector (multiple) random variables, sum of random variables, moments, transformation on these variables.(a,e) 5. to be able to generate random numbers with desired distributions using Matlab.(k) 6. Introduction to Random Processes (RPs).(a)
Important material	<ul style="list-style-type: none"> - Lecture notes - References - Internet resources - YouTube videos

References:

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

Major Topics Covered and Schedule in Weeks:

Topic	# Weeks	# Contact hours*
Definition of random experiment, probability of event, conditional probability, sampling techniques, Bernoulli trials.	3	9
Definition of random variable, C.D.F and P.D.F. of R.V., types of R.V's, most popular distributions, using C.D.F and P.D.F. to compute probability of event.	3	9
Statistical properties of R.V., transformation of P.D.F. , transformation of R.V.	2	6

Definition of vector of random variables, J.C.D.F and J.P.D.F. of R.V's., marginal C.D.F and P.D.F. using J.C.D.F and J.P.D.F. to compute probability of event in joint sample space.	3	9
Statistical properties of multiple R.V's., transformation of J.P.D.F. , transformation of multiple R.V's.	3	9
Introduction to random processes.	1	3
Total	15	45

Course Policy

- If you miss class, there won't be a makeup test, quiz, etc. and you WILL get a zero unless you have a valid excuse.
- Cheating and plagiarism are prohibited.
- absence of 15% of classes will deprive you automatically .

Student Outcomes (SO) Addressed by the Course:

#	<i>Outcome Description</i>	<i>Contribution</i>
<i>General Engineering Student Outcomes</i>		
(a)	An ability to apply knowledge of mathematics, science, and engineering	<i>H</i>
(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	<i>H</i>
(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	<i>L</i>

H=High, M= Medium, L=Low