

Detailed Course Description - Course Plan Development and Updating Procedures/ Department	QF01/0408-3.0E
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Faculty	Science	Department	Mathematics
Course number	0101341	Course title	Probability theory
Number of credit hours	3	Pre-requisite/co-requisite	Calculus(3) Statistics and probability

Brief course description

Basic axioms of the probability and probability rules, random variables and probability distributions, multivariate density and multivariate distributions and functions of random variables.

Course goals and learning outcomes	
Goal 1	Use axioms and basic theorems of probability to solve real world problems.
Learning outcomes	1.1 Students will be able to understand a probability concept. 1.2 Students will be able to use the probability rules to solve the problems. 1.3 Students will be able to write mathematical model of a mystery problem.
Goal 2	Demonstrate understanding of the basic concepts of discrete and continuous random variables
Learning outcomes	2.1 Students will be able to understand the meaning of the random variable and distinguish discrete and continuous R.V. 2.2 Students will be able to use the probability distributions and density functions of the R.Vs. 2.3
Goal 3	a. Compute the moments of various discrete and continuous probability distributions.
Learning outcomes	3.1 Students will be able to compute a mathematical expectation and standard deviation of the R.Vs. 3.2 Students will be able to compute all moments of the R.Vs using the moment generating function. 3.3
Goal 4	Obtain the distribution of transformed random variables
Learning outcomes	4.1 Students will be able to obtain the probability distribution from other. 4.2 Students will be able to obtain the probability distribution of a function of random variables. 4.3
Textbook	1.- Mathematical Statistics with applications, seventh edition, By Miller & Miller. Pearson Prentice Hall (2004)

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	2.- Mathematical Statistics with applications , 7 th edition. By Dennis Wackerly, William Mendenhall and Richard Scheaffer, Publisher Thomson. Brooks /Cole 2008
Supplementary references	1.- Modern Mathematical Statistics with Applications . By Devore, Jay,L. and Berk,Kenneth,N. Publisher Thomson Brooks/Cole 2007 2.- Introduction to Probability and Mathematical Statistics , 2 nd edition. By Bain, Lee, J. and Engelhardt, Max. Publisher Duxbury Press 1987 3.-

Course timeline

Week	Number of hours	Course topics	Pages (textbook)	Notes
01	1 1 1	Sample Space, Set operations with events Probability of events, Addition Rule	24-39	
02	1 1 1	Conditional probability Multiplication Rule, Independent events, Law of Total Probability and Bayes Rule	40-52	
03	1 1 1	Concept of a random variable and its probability distribution.	69-80	
04	1 1 1	. Expectations and Variance. Moments and moment generating function.	129-147	
05	1 1 1	Distribution functions and probability density Specific Discrete parametric distributions- Univariate: Uniform, Binomial ,Poisson, Hyper- geometric.	164-185	
06	1 1 1	Specific Continuous parametric distributions- Univariate Uniform First Exam 20%	200-210	
07	1 1 1	,Exponential ,Normal Joint distributions, Joint distribution function. Joint moment.	210-215 92-1106	
08	1 1 1	Conditional distributions, Independence of random variables.	107-114	
09	1 1	Product moments and conditional expectation	148-158	

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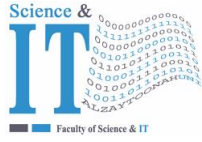
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10	1 1 1	Functions of random variables. Transformation technique one variable.	246-255	
11	1 1	Transformation technique several variable.	246-255	
12	1 1 1	Moment-Generating function technique (Second Exam 20%)	256-258	
13	1 1 1	Special probability densities	201-219	
14	1 1 1	Sampling distribution		
15	1 1 1	Distributions of Sample mean and sample variance	266-279	
16	1 1 1	Final Exam 50%		

Theoretical course evaluation methods and weight	Participation = 10% First exam 20% Second exam 20% Final exam 50%	Practical (clinical) course evaluation methods	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%
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Approved by head of department		Date of approval	
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Extra information (to be updated every semester by corresponding faculty member)

Name of teacher	D. Abdulkarim Farah	Office Number	127
Phone number (extension)	380	Email	karim.farah@zug.edu.jo
Office hours			



جامعة الزيتونة الأردنية
Al-Zaytoonah University of Jordan
كلية العلوم وتكنولوجيا المعلومات
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"Tradition and Quality"

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