Jordan University of Science and Technology

Faculty of Science & Arts

Mathematics Department

MATH230 Probability Theory

First Semester 2017-2018

Course Catalog
3 Credit Hours. Definition and axioms of probability, some probability theorems, conditional probability and independence. Random variables, probability distributions, expectation, some discrete and continuous distributions,. Joint distributions, marginal and conditional distributions, distributions of functions of random variables: the cumulative distribution function method, moment generating function method, Jacobian method, sampling distributions, limiting distributions.

Text Book	
Title	Probability and Mathematical Statistics
Author(s)	Prasanna Sahoo
Edition	1st Edition
Short Name	1
Other Information	2013

Course References

Short name	Book name	Author(s)	Edition	Other Information
3	Introduction to Mathematical Statistics	Hogg, R., Craig, S., and Mckean, J	6th Edition	
2	Mathematical Statistics with Applications	Wackerly, D., Mendenhall, W., and Scheaffer, R	7th Edition	

Instructor	
Name	**Dr. Mahmoud Smadi**
Office Location	PH2 L1

Office Hours	Sun : 12:30 - 14:00 Mon : 12:30 - 14:00 Tue : 12:30 - 14:00 Wed : 12:30 - 14:00 Thu : 12:30 - 14:00
Email	smadi@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Mon, Wed : 10:00 - 11:30 Room: M3306

Prerequisites		
Line Number	**Course Name**	**Prequisite Type**
902010	MATH201 Intermediate Analysis	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction : Combinatorial Methods	
Week 2	Probability: Sample spaces, Events, Rules of Probability	
Week 3	Bayes Theorem. Independent Events.	
Week 4	Probability Distribution and Densities: Discrete and Continuous Random Variables.	
Week 5	Mathematical Expectation. Expected Value, Moments, Moment Generating Functions.	
Week 6	Special Probability Distributions: Discrete Uniform Distribution, Bernoulli Distribution, Binomial Distribution.	
Week 7	Geometric distribution. Negative binomial distribution, Hypergeometric and Poisson Distribution.	
Week 8	Special probability Densities: Uniform Density, Exponential Distributions, and Gamma Distributions.	
Week 9	Beta Distributions, Normal Distributions, and Cauchy distributions.	
Week 10	Joint Distributions. Marginal and Conditional Distributions.	
Week 11	Covariance, Conditional Expectation.	
Week 12	Functions of Random Variables: Distribution Function Technique and Order Statistics.	
Week 13	Transformation Technique. Moment Generating Function Technique.	

Week 14	Laws of Large Numbers and Central Limit Theorem	

Mapping of Course Objectives to Program Student Outcomes[1]	Assessment method
Define and illustrate basic probability concepts, and rules, conditional probability, and use Bayes' Rule. [1a, 1b]	FIRST EXAM
Define, illustrate and apply the concepts of discrete and continuous random variables [1a, 1b]	FIRST EXAM
Define, illustrate and apply certain frequently used discrete and continuous probability distributions. [1a, 1b]	
Define, illustrate and apply the concept of the expectation to the mean, variance, moment, and moment generating function.. [1a, 1b]	
Define, illustrate joint distributions, conditional distributions, and covariance function. [1a, 1b]	
Illustrate and apply theorems concerning the distributions of functions of random variables using CDF, transformation, and moment generating function method. [1a, 1b]	
Illustrate and apply weak law of large numbers and central limit theorem [1a, 1b]	

Relationship to Program Student Outcomes (Out of 100%)										
a	b	c	d	e	f	g	h	i	j	k
50	50									

Evaluation	
Assessment Tool	**Weight**
FIRST EXAM	30%

Date Printed: 2017-11-28

Our conference integrates all fields of Probability Theory, Mathematical Statistics and its Applications. Considering its fundamental and interdisciplinary character, the objective of the conference is to encourage communication between researchers throughout the world whose research is related to various aspects of Probability Theory and Mathematical Statistics. We are glad to see at our event both theoretical researchers and applied scientists. In order to broaden the audience of the conference the sections on Statistical Applications, Data Science and Machine Learning are also introduced. W This course provides an elementary introduction to probability and statistics with applications. Topics include: basic combinatorics, random variables, probability distributions, Bayesian inference, hypothesis testing, confidence intervals, and linear regression. The Spring 2014 version of this subject employed the residential MITx system, which enables on-campus subjects to provide MIT students with learning and assessment tools such as online problem sets, lecture videos, reading questions, pre-lecture questions, problem set assistance, tutorial videos, exam review content, and even online e

Our conference integrates all fields of Probability Theory, Mathematical Statistics and its Applications. Considering its fundamental and interdisciplinary character, the objective of the conference is to encourage communication between researchers throughout the world whose research is related to various aspects of Probability Theory and Mathematical Statistics. We are glad to see at our event both theoretical researchers and applied scientists. In order to broaden the audience of the conference the sections on Statistical Applications, Data Science and Machine Learning are also introduced. W Statistics of Random Processes. Probability Theory. Ass. prof. S.M. Anan'evskii. Mathematical Statistics. Probability Theory. Probability Theory and Mathematical Statistics. Prof. A. N. Borodin.Â Asymptotical Effectivity of Statistical Criterions. Mathematical Statistics. Nonstandard Probabilistic Problems. Probability Theory and Mathematical Statistics. Prof. V. V. Petrov. Hundreds of lectures on probability and statistics, with examples and solved exercises. Rigorous, but easy to understand. Ideal for self-study.Â Statlect is a free digital textbook on probability theory and mathematical statistics. Explore its main sections. Fundamentals of probability theory. Read a rigorous yet accessible introduction to the main concepts of probability theory, such as random variables, expected value, variance, correlation, conditional probability. Probability distributions. Explore this compendium of common probability distributions, including the binomial, Poisson, uniform, exponential and normal distributions. Asymptotic theory.