



**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	
<b>Title</b>	Probability and Mathematical Statistics
<b>Author(s)</b>	Prasanna Sahoo
<b>Edition</b>	1st Edition
<b>Short Name</b>	1
<b>Other Information</b>	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	Prerequisite 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	
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Mapping of Course Objectives to Program Student Outcomes <sup>1</sup>	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%

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Probability tells us how often some event will happen after many repeated trials. This topic covers theoretical, experimental, compound probability, permutations, combinations, and more! If you're seeing this message, it means we're having trouble loading external resources on our website. If you're behind a web filter, please make sure that the domains \*.kastatic.org and \*.kasandbox.org are unblocked. Courses. Search. Donate Login Sign up. Search for courses, skills, and videos. Main content. Statistics and probability. Unit: Probability. Statistics and probability. Unit: Probability. 0.