



Jordan University of Science and Technology
Faculty of Science & Arts
Mathematics Department

MATH330 Mathematical Statistics

First Semester 2023-2024

Course Catalog

3 Credit Hours. The concept of statistical inference, estimation, point estimation, methods of estimation; moments, MLE, least squares estimates, properties of estimators, unbiased estimators, sufficient statistics, complete statistics, Fisher information criteria, Rao-Cramer inequality, exponential family distributions, interval estimation, testing of hypotheses, the Neyman-Pearson lemma, uniformly most powerful tests, likelihood ratio tests..

Text Book

Title	Mathematical Statistics with Applications
Author(s)	D. Wackerly, W. Mendenhall and R. Scheaffer
Edition	7th Edition
Short Name	TextBook
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref 1	Introduction to Mathematical Statistics	1. Hogg, R. V., Craig, A. T., and Mckean, J.	1st Edition	
Ref 2	Probability and Statistics: The science of Uncertainty	Evans, M. and Rosenthal, J.	1st Edition	
Ref 3	Statistical Inference	Casella, G. and Berger, R.	2nd Edition	

Instructor

Name	Dr. Mahmoud Smadi
Office Location	PH2 L1
Office Hours	

Email	smadi@just.edu.jo
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Class Schedule & Room

Section 1:
Lecture Time: Sun, Tue, Thu : 11:30 - 12:30
Room: NG42

Prerequisites

Line Number	Course Name	Prerequisite Type
902301	MATH230 Probability Theory	Prerequisite / Pass

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Review Probability distributions	
Week 2	Sampling distribution from normal distribution	
Week 3	Estimation: moment and maximum likelihood estimators	
Week 4	Bayes estimators and least squares estimators	
Week 5	Properties of estimators: unbiased and consistent estimators, Fisher information	
Week 6	Uniformly minimum variance unbiased estimators.	
Week 7	Cramer Rao Lower Bound (CRLB), exponential family distributions	
Week 8	Sufficient statistics and Rao-Blackwell Theorem	
Week 9	Completeness, Lehman-Sheffe Theorem	
Week 10	Interval estimation, Pivotal method. Confidence interval for mean and variance of normal distribution	
Week 11	Approximate Confidence Intervals	
Week 12	Hypothesis testing: Introduction, Neyman-Pearson lemma	
Week 13	Uniformly most powerful tests	
Week 14	Likelihood ratio tests	
Week 15	Hypothesis testing: Normal distribution	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
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Be able to know and understand sampling distribution from a normal distribution; t, Chi-square, and F distribution [1SLO1]	30%	
Be able to know and understand different methods of estimation and their properties. [1SLO1]	30%	
Be able to interpret and construct interval estimation. [1SLO1, 1SLO3]	16%	
Be able to know and understand the basics of testing hypotheses and deriving statistical tests. [1SLO1, 1SLO3]	24%	

Relationship to Program Student Outcomes (Out of 100%)					
SLO1	SLO2	SLO3	SLO4	SLO5	SLO6
80		20			

Evaluation	
Assessment Tool	Weight
First Exam	30%
Second Exam	30%
Final Exam	40%

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