King Fahd University of Petroleum and Minerals
Department of Mathematics

STAT-502: Statistical Inference (Term 222)

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Office Hours: To be announced

Course Objectives: To master the basics of estimation theory with an aim to apply the popular probability models to samples for statistical inference.

Course Description: Methods of estimation. Properties of estimators: consistency, sufficiency, completeness and uniqueness. Unbiased estimation. The method of moments. Maximum likelihood estimation. Techniques for constructing unbiased estimators and minimum variance unbiased estimators. Bayes estimators. Asymptotic property of estimators. Introduction to confidence intervals. Confidence intervals for parameters of normal distribution. Methods of finding confidence intervals. Fundamental notions of hypotheses testing. The Neyman-Pearson lemma. Most powerful test. Likelihood ratio test. Uniformly most powerful tests. Tests of hypotheses for parameters of normal distribution. Chisquare tests, t-tests, and F-tests.

Textbook: *Introduction to Mathematical Statistics* by RV Hogg, JW McKean and AT Craig, 8th edition, Pearson 2018.

Course Assessment

Activity	Weight
Class Participation (assignments, quizzes, attendance, etc.)	25%
Midterm Exam(s)	35%
Final Exam (Comprehensive)	40%

Academic Integrity: All KFUPM policies regarding **ethics** and **academic honesty** apply to this course.

Schedule

Chapter No.	Chapter Name	No. of Weeks
4	Some Elementary Statistical Inferences	4
5	Consistency and Limiting Distributions	2
6	Maximum Likelihood Methods	3
7	Sufficiency	2
8	Optimal Tests of Hypotheses	4