

King Fahd University of Petroleum and Minerals

Department of Mathematics

STAT 502 Syllabus, Term 242 (2024-25)

Instructor: Dr. Nasir Abbas (nasirabbas@kfupm.edu.sa)

Course Title: Statistical Inference

Course Credit Hours: 3-0-3

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

Course Main 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. Chi-square tests, t-tests, and F-tests.

Prerequisite: STAT501

Grading Policy:

Activity	Weight
Class Participation (homework, attendance, bonuses, etc.)	15%
Quizzes	15%
Midterm Exam	30%
Final Exam	40%

Letter Grades: The letter grades will follow a grading curve, which depends on the average of all students enrolled in the course.

Cheating in Exams: Cheating or any attempt of cheating by use of illegal activities, techniques and forms of fraud will result in a grade of DN in the course along with reporting the incident to the higher university administration for further action. Cheating in exams includes (but is not restricted to):

- Looking at the papers of other students.
- Talking to other students.
- Using mobiles, smart watches or any other electronic devices.

Missing an Exam: In case a student misses an exam (Exam I, Exam II, or the Final Exam) for a legitimate reason (such as medical emergencies), he must bring an official excuse from Students Affairs. Otherwise, he will get a score of zero in the missed exam.

Attendance: Students are expected to attend all classes.

- If a student misses a class, he is responsible for any announcement made in that class.
- Attendance **on time** is crucial and will be checked at the beginning of each class. Arriving more than 5 minutes after the class starts will be marked as **late**. Every 2 instances of being late will count as 1 absence. Entering the class after half the scheduled class time (25 minutes) has passed will be marked as an absence.
- Only excuses issued by the **Students' Affairs** office at KFUPM will be accepted; excuses from other sources, such as medical centers, government or private offices, will not be considered.
- After warned **twice** by the instructor, a DN grade will be awarded to any student who accumulates
 - 9 (20%) unexcused absences.
 - 15 (33%) excused and unexcused absences.

The Usage of Mobiles in Class: Students are not allowed to use mobiles for any purpose during class time. Students who want to use electronic devices to take notes must get permission from their instructor. Violations of these rules will result in a penalty decided by the instructor.

Academic Integrity: All KFUPM policies regarding ethics apply to this course. See the Undergraduate Bulletin on the Registrar's website.

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