

King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
STAT501: Probability and Mathematical Statistics
Term 181

Instructor: Dr. Nasir Abbas

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Office Hours: 11:05 am – 12:30 pm UTR (Tentative)

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

Course Description: Axioms and foundations of probability. Conditional probability and Bayes' theorem. Independence. Random variables and distribution functions and moments. Characteristic functions. Laplace transforms and moment generating functions. Function of random variables. Random vectors and their distributions. Convergence of sequences of random variables. Laws of large numbers and the central limit theorem. Random samples, sample moments and their distributions. Order statistics and their distributions.

Pre-requisite: Graduate standing

Textbook: Rohatgi, V.K. and Saleh, A.K. (2015) An Introduction to Probability and Statistics, Wiley 3rd Edition.

Software: Minitab 17.

Assessment*

Activity	Weight
Class Evaluation (homework, quizzes, attendance, participation, etc.)	10%
First Major Exam	20%
Second Major Exam	20%
Third Major Exam	20%
Final Exam (Comprehensive)	30%

Grade Assignment

Score	87 – 100	80 – 86.9	75 – 79.9	70 – 74.9	65 – 69.9	60 – 64.9	55 – 59.9	50 – 54.9	0 – 49.9
Grade	A+	A	B+	B	C+	C	D+	D	F

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

General Notes:

- Students are required to carry pens, note-taking equipment and a calculator to EVERY lecture and exams. It is strongly recommended to keep a binder for class-notes.
- Students are also expected to bring the book, take notes and organize their solved questions in a binder for easy retrieval to help them in study and review for class, exams, etc.
- It is to the student's advantage to keep a binder for storing class notes, homework, and other graded assignments. Students who are organized will find it easier to find important materials when studying for exams.
- To successfully prepare for the exams, students MUST solve problems regularly and with discipline. The selected assigned problems are specifically designed to prepare you for major and final exams. So, it is expected that you complete these problems step-by-step and with comprehension.
- Never round your intermediate results to problems when doing your calculations. This will cause you to lose calculation accuracy. Your answers may then be different from the exam keys even when you use the right procedure.

Schedule (tentative)

WEEK	Topics
Week 1 Sep 02 - 06	A Mathematical Introduction, Elementary Probabilistic Methods
Week 2 Sep 09 - 13	Elementary Probabilistic Methods (cont) Discrete Random Variables
Week 3 Sep 16 - 20	Properties of Discrete Random Variables Continuous Random Variables
Week 4 Sep 24 – 27 + Sep 29	Properties of Continuous Random Variables Mathematical Aspect of Selected Discrete Probability Models
Week 5 Sep 30 - Oct 04	Mathematical Aspect of Selected Continuous Random Variables Joint Discrete Random Variables
Week 6 Oct 07 – 11	Joint Continuous Random Variables Functions of Random Variables
Week 7 Oct 14 – 18	Fixed Sample, Random Sample, Sampling Distributions
Week 8 Oct 21 – 25	Sampling Distributions (cont) Limiting Distributions
Week 9 Oct 28 – Nov 01	Limiting Distributions (cont) Order Statistics
Week 10 Nov 04 - 08	Order Statistics (cont)
Week 11 Nov 11 - 15	Bivariate Normal Distribution
Week 12 Nov 18 - 22	Normal Sampling Distributions for Inference
Week 13 Nov 25 - 29	Large Sample Theory Simulation Continuous Bivariate Distributions
Week 14 Dec 02 - 06	Sampling Theories for Bivariate Normal Distribution
Week 15 Dec 09 - 13	Continuous Multivariate Distributions Non-Central Probability Functions Review