King Fahd University of Petroleum and Minerals Dhahran, Saudi Arabia
Department of Mathematics
STAT-501: Probability and Mathematical Statistics (Term 212)

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Office Hours: To be announced

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.

Textbook: *An Introduction to Probability and Statistics* by VK Rohatgi and AK Saleh, 3rd Edition, Wiley Series in Probability and Statistics, 2015.

Course Assessment

Activity	Weight
Class Participation (home works, quizzes, attendance, project etc.)	15%
First Major Exam	25%
Second Major Exam	25%
Final Exam (Comprehensive)	35%

Important Notes:

Blackboard: All contacts or announcements between the instructor and the students are supposed to be through Blackboard, so the student must check his Blackboard at least once a day.

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

Attendance Notes:
- In accordance with University rules, 20% unexcused absences will automatically result in a grade of DN.
- Attendance on time is very important. Mostly, attendance will be checked within the first five minutes of the class. Entering the class after that, is considered as one late, and every two times late equals to one absence.

Cheating and Plagiarism: This course is composed of individual assignments. It is important that your individual assignment be completed with your own efforts instead of copying it from your fellow student. KFUPM instructors follow "*zero tolerance*" approach with regard to cheating and plagiarism. During examinations (quizzes and major exams) cheating or any attempt of cheating by use of illegal activities, techniques and forms of fraud will result in a *grade of F* in the course along with reporting the incident to the higher university administration.

Schedule (tentative)

WEEK	Topics
Week 1	A Mathematical Introduction, Elementary Probabilistic Methods
Week 2	Elementary Probabilistic Methods (cont) Discrete Random Variables
Week 3	Properties of Discrete Random Variables Continuous Random Variables
Week 4	Properties of Continuous Random Variables Mathematical Aspect of Selected Discrete Probability Models
Week 5	Mathematical Aspect of Selected Continuous Random Variables Joint Discrete Random Variables
Week 6	Joint Continuous Random Variables Functions of Random Variables
Week 7	Fixed Sample, Random Sample, Sampling Distributions
Week 8	Sampling Distributions (cont) Limiting Distributions
Week 9	Limiting Distributions (cont) Order Statistics
Week 10	Order Statistics (cont)
Week 11	Bivariate Normal Distribution
Week 12	Normal Sampling Distributions for Inference
Week 13	Large Sample Theory Simulation Continuous Bivariate Distributions
Week 14	Sampling Theories for Bivariate Normal Distribution
Week 15	Continuous Multivariate Distributions Non-Central Probability Functions