KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
DHAHRAN, SAUDI ARABIA

STAT301: Introduction to Probability Theory (Term 212)

Instructor: Dr. Taleb Alkurdi **Office:** 5-307
Phone : 860-2720 **Email :** tsoalkurdi@kfupm.edu.sa

Textbook: A First Course in Probability by Sheldon Ross, 9th edition

Course Description:
Basic classical models of probability. Set functions. Axiomatic definition of probability. Conditional probability and Bayes' theorem. Random variables and their types. Distributions, moments, and moment generating functions. Special discrete and continuous distributions. Random vectors and their distributions. Marginal and conditional distributions. Independent random variables. Functions of random variables. Sums of independent random variables. Weak law of large numbers and the central limit theorem.

Prerequisite: MATH 201, STAT 201 or STAT 212 or STAT 213 or STAT 319

Assessment
Assessment for this course will based on attendance, homework, quizzes, three major exams and a comprehensive final exam, as in the following:

Activity	Weight
Class Participation (homework, quizzes, attendance, etc.)	10%
First Major Exam *(Chapters 1-3, Week 5) February 16, 2022*	17%
Second Major Exam *(Chapter 4-5, Week 10) March 23, 2022*	19%
Third Major Exam *(Chapters 6-7, Week 14) April 20, 2022*	19%
Final Exam *(Comprehensive, as per university schedule)*	35%

Grade Assignment (based on average ~70%)

A+	A	B+	B	C+	C	D+	D	F
90 - 100	83 - < 90	78 - < 83	71 - < 78	65 - < 71	60 - < 65	55 - < 60	50 - < 55	0 - < 50

***You need to achieve at least 50% in order to pass the course**
Academic Integrity: All KFUPM policies regarding **ethics** and **academic honesty** apply to this course.
Important Notes:

- ✓ In accordance with university rules, ***Six (6) unexcused absences*** will automatically result in a grade of ***DN***. It is students' responsibility to provide valid written excuses on time before a ***DN*** report is issued.
- ✓ ***Attendance*** on time is ***very*** important.
- ✓ The ***Homework*** should be submitted in the first Saturday after completing the chapter ***and no need for an announcement in advance***.
- ✓ No late homework will be accepted.

Week	*Sections*	Topics (Tentative)
Week 1 **January 17 - 19**	**Ch.1** 1-5	Introduction, The Basic Principle of Counting, Permutations, Combinations, Multinomial Coefficients.
Week 2 **January 24 - 26**	**Ch. 2** 1-4	Introduction, Sample Space and Events, Axioms of Probability, Some Simple Propositions.
Week 3 **Jan 31-February 2**	**Ch.2** 5-6	Sample Space Having Equally Likely Outcomes, Probability as a Continuous Set Function.
Week 4 **February 7 - 9**	**Ch. 3** 1-3	Introduction, Conditional Probability, Bayes's Formula
Week 5 **February 14 - 16**	**Ch. 3** 4-5	Independent Events, $P(. \mid F)$ Is a Probability?
Week 6 **February 21 - 23**	**Ch. 4** 1-5	Random Variables, Discrete Random Variables, Expected value, Expectation of a Function of a Random variable, Variance.
Week 7 **Feb 28 -March 2**	**Ch. 4** 6-7	The Bernoulli and Binomial Random Variables, The Poisson Random variable.
Week 8 **March 7- 9**	**Ch. 4** 8-10	Other Discrete Probability Distributions, Expected Value of Sums of Random Variables, properties of the Cumulative Distribution Function.
Week 9 **March 14 - 16**	**Ch. 5** 1-5	Introduction, Expectation and Variance of Continuous Random Variables, The Uniform Random Variable, Normal random Variables Exponential Random Variables.
Week 10 **March 21 - 23**	**Ch.5** 6-7	Other Continuous Distributions, The Distribution of a Function of Random variables
Week 11 **March 28 – 30**	**Ch.6** 1-3	Joint Distribution Functions, Independent Random variables, Sums of Independent Random variables.
Week 12 **April 4 - 6**	**Ch.6** 4-7	Conditional Distributions: Discrete Case, Conditional Distributions: Continuous Case, Order Statistics, Joint Probability Distribution of Functions of Random Variables.
Week 13 **April 11 - 13**	**Ch.7** 1-3	Introduction, Expectation of Sums of Random Variables, Moments of the Number of Events that Occur.
Week 14 **April 18 - 20**	**Ch.7** 4-7	Covariance, Variance of Sums, and Correlations, Conditional Expectation, Conditional and Prediction, Moment Generating Functions.
Week 15 **May 9 - 11**	**Ch.8** 1-5	Introduction, Chebyshev's Inequality and WLLN, The Central Limit Theorem, The SLLN, Other Inequalities. (if time permits)