

King Fahd University of Petroleum and Minerals

Department of Mathematics and Statistics

STAT-301: Introduction to Probability Theory

Spring Semester 2018 (Term 172)

Instructor: Nasir Abbas
Phone: 013-860-4485

Office: 5-333
E-mail: nasirabbas@kfupm.edu.sa

Office Hours (Tentative): UTR. 8:55 am – 09:55 am, or by appointment

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.

Textbook: A First Course in Probability by Sheldon Ross, 9th edition. Pearson Education, 2014.

Assessment*

Activity	Weight
Class Participation (home works, quizzes, attendance, etc.)	10%
First Major Exam <i>(Chapters 1-3, Week 5)</i>	18%
Second Major Exam <i>(Chapter 4-5, Week 10)</i>	21%
Third Major Exam <i>(Chapters 6-7, Week 14)</i>	21%
Final Exam <i>(Comprehensive, as per university schedule)</i>	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.

Important Notes:

- ✓ Only University issued excuses will be accepted.
- ✓ **Attendance** on time is *very* important.
- ✓ Use of **mobile** is ***banned*** during the class.
- ✓ **Homeworks** will be assigned later.

Weekly Schedule

Date	Section	Topics (Tentative)
Week 1 January 21 - 25	Chapter 1 Sections 1-5	Introduction, The Basic Principle of Counting, Permutations, Combinations, Multinomial Coefficients.
Week 2 January 28 – February 01	Chapter 2 Sections 1-4	Introduction, Sample Space and Events, Axioms of Probability, Some Simple Propositions.
Week 3 February 04-08	Chapter 2 Sections 5-6	Sample Space, Having Equally Likely Outcomes, Probability as a Continuous Set Function.
Week 4 February 11-15	Chapter 3 Sections 1-3	Introduction, Conditional Probability, Bayes's Formula
Week 5 January 18-22	Chapter 3 Sections 4-5	Independent Events, Is $P(. F)$ a Probability?
Week 6 February 25 – March 01	Chapter 4 Sections 1-4	Random Variables, Discrete Random Variables, Expected value, Expectation of a Function of a Random variable, Variance.
Week 7 March 04 - 08	Chapter 4 Sections 6-7	The Bernoulli and Binomial Random Variables, The Poisson Random variable.
Week 8 March 11 - 15	Chapter 4 Sections 8-10	Other Discrete Probability Distributions, Expected Value of Sums of Random Variables, properties of the Cumulative Distribution Function
Week 9 March 18 - 22	Chapter 5 Sections 1-5	Introduction, Expectation and Variance of Continuous Random Variables, The Uniform Random Variable, Normal random Variables, Exponential Random Variables.
Week 10 March 25 - 29	Chapter 5 Sections 6-7	Other Continuous Distributions, The Distribution of a Function of Random variables.
Week 11 April 01 - 05	Chapter 6 Sections 1-3	Joint Distribution Functions, Independent Random variables, Sums of Independent Random variables.
Week 12 April 08 - 12	Chapter 6 Sections 4-7	Conditional Distributions: Discrete Case, Conditional Distributions: Continuous Case, Order Statistics, Joint Probability Distribution of Functions of Random Variables.
Week 13 April 15 - 19	Chapter 7 Sections 1-3	Introduction, Expectation of Sums of Random Variables, Moments of the Number of Events that Occur.
Week 14 April 22 - 26	Chapter 7 Sections 4-7	Covariance, Variance of Sums, and Correlations, Conditional Expectation, Conditional and Prediction, Moment Generating Functions
Week 15 April 29 – May 03	Chapter 8 Sections 1-5	Introduction, Chebyshev's Inequality and WLLN, The Central Limit Theorem, The SLLN, Other Inequalities. (if time permits)