

King Fahd University of Petroleum & Minerals
Mathematics & Statistics Department

Syllabus
Introduction to Probability Theory
Term 142

Course Name : (STAT301) Introduction to Probability Theory.
Prerequisites : (STAT201) Introduction to Statistics.
(MATH201) Calculus III.
Class Schedule : UTR 11:00-11:50, Bld 4 Room 100.
Instructor : **Name:** Monjed H. Samuh
E-mail: monjedsamuh@kfupm.edu.sa
Website: <http://faculty.kfupm.edu.sa/math/monjedsamuh/>
Office : Bld 5 Room 410.
Office Hours : UTR 09:00-09:50 or by appointment (via email).

Textbook Ross, S., (2014). **A First Course in Probability** (9th ed.). Prentice Hall.

Recommended Texts

1. Feller, W. (1970). *An Introduction to Probability Theory and its Applications*, Volume I (3rd ed.). John Wiley & Sons.
2. Hogg, R.V., McKean, J., and Craig, A.T, (2012). *Introduction to Mathematical Statistics* (7th ed.). Harlow: Pearson Education Limited.
3. Bain, L.J., and Engelhardt, M. (2000). *Introduction to Probability and Mathematical Statistics* (2nd ed.). Pacific Grove, CA: Duxbury.
4. Hogg, R.V., Tanis, E., and Zimmerman, D. (2014). *Probability and Statistical Inference* (9th ed.). Prentice Hall.
5. Dennis D.W., Mendenhall, W., Scheaffer, R.L., Bain, L.J., and Engelhardt, M. (2010). *Mathematical Statistics and Probability*. Andover: Brooks/Cole Cengage Learning.

Course Objectives The main objective of the Stat301 is to present techniques and basic results of probability, and be able to apply and communicate them in practice.

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.

Intended Learning Outcomes After the completion of this course, students should be able to:

1. understand the axiomatic approach to probability, counting and combinatorial methods, and Bayes' Theorem.
2. understand random variables and their properties, including marginal and conditional distributions, expectation, conditional expectation, covariance and correlation.
3. derive and use the moment generating function.
4. define and work with the concepts of multivariate distributions.
5. determine distributions of functions of random variables.
6. gain the ability to prove results in probability.
7. state, explain and use the central limit theorem.

Course Policies

- Please do the reading from the sections to be covered before coming to class each day. Your instructor will be planning class activities assuming you have done the reading.
- **Homework:** There will be two types of homework assignments.
 1. **Mini Homework:** these are problems which arise while lecturing. I will assign a mini homework almost every class day.
 2. **Major Homework:** these are set of problems assigned weekly.
- You may collaborate on homework, but you must write your submitted work in your own words. All steps are required, this includes showing calculations, derivations, and proofs.
- You have to devote to this class several hours per week of concentrated attention to understand the subject enough so that standard problems become routine. If you think that coming to class and reading the examples while also doing something else is enough, you're in for an unpleasant surprise on the exams.
- Attending classes is compulsory; according to the University regulations, 8 or more unexcused absences will earn you a grade of **DN**.

- In the event that a student has to miss a class, he is responsible to get caught up with the materials covered and homework assigned.
- All students are expected to be in the classroom on time. Being late will be treated as being absent.
- It is the student's responsibility to observe the academic calendar for important dates.
- It is the student's responsibility to be knowledgeable about the rules and regulations that govern your study at the university.
- No make-up tests will be hold in any circumstance, any student with accepted excuse will be given the grade of the final transferred to appropriate weight. Make-up of the final test will follow the university regulations.
- I assume, the students come to class to learn, I come to class to teach.
 - We will be respectful of everyone in class.
 - Mobiles should be turned off before the beginning of each class, no exceptions.
 - There will be no talking in class, except to ask instructor questions or share comments with the entire class. Talking is disruptive to the class and disrespectful to the Instructor.
 - There will be no texting, reading, eating, etc., while in class.
- Cheating will be dealt with according to the University rules.
- Wastah is the thing that the Instructor hates the most!. Definitely, No grade will be changed because of Wastah.

Grade Distribution

- Your final grade will depend on the following components with these proportions:
 - **Assignments and Quizzes (20%): Quizzes may not be announced in advanced.**
 - **First Test (20%):** March 5, 2015 (Thursday).
 - **Second Test (25%):** April 23, 2015 (Thursday).
 - **Final Exam (35%):** May 25, 2015 (Monday) – As per the official schedule.
- You need to achieve at least 50% in order to pass the course.
- **Grading Scale**

Score	87-100	80-86	75-79	70-74	65-69	60-64	55-59	50-54
Grade	A+	A	B+	B	C+	C	D+	D