**King Abdulaziz University**
**Department of statistics**
**Course name: Theory of Probability**
**Instructor name: Samah Sindi**
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**Office: 167S**
**Building: 61, Class Room:125G**
**Time: 8 - 9:30 M.W**
**Stat 210 BAR**
**Office hours: M.W: 9:30-11**
**Building: 61, Office:167S**

**Course Syllabus**

***The main objective of the course*** is to introduce students to the elementary probability theory, its mathematics and applications. This course focuses on univariate random variables and discuss in details the well known discrete and continuous random variables and some other distributions..

***Course objectives:*** At the end of this course, the student should be able to deal with the following:

- basic assumption of probability theory.
- moments for discrete and continuous random variables.
- some important discrete and continuous distributions and be able to apply these distributions in practical problems.

***Books and references***

#1. "**A First course in probability" ,** Sheldon **Ross** (2006), seven edition (chapters **1,2,3,4,5**)

#2. **" Fundamental of Applied Probability and Random Processes"**, **Oliver** C Ibe (2005) (chapters **1,2,3,4**)

***Student assessment***

**First Exam: 20% [ Week # 7: 20 March]**
**Second Exam: 20% [ Week # 12: 1 May]**
**Home Work and quiz : 10% [Quiz#1 : 15 March, Quiz#2: 26 Apr.]**
**Lab.: 10%**
**Final Exam: 40%**

Course Schedule

| Week # | Date | Topics | Reading Assignment |
|---|---|---|---|
| 1 | 6, 8 Feb. | Revision of Mathematical Topics**(Diff., Integra., Gamma Fun., Beta Fun., Sets)** | |
| 2 | 13, 15 Feb. | Combinatorial Analysis **(Counting rules, Permutations, Combinations)** | Ch.1 |
| 3 | 20, 22 Feb. | Basic Probability concepts (**Sample space and events, def. of probability, properties of Probability**) | Ch.2 |
| 4 | 27 Feb, 1 March | **Independence events, conditional probability, applications of permutations and combinations in probability.** | Ch.3 |
| 5 | 6, 8 March | **Total probability and Bayes theorem, and tree diagram.** | Ch.3 |
| 6 | 13, 15 March | **Discrete random variable, cumulative distribution function, probability mass function, expectation, variance , moments.** | Ch.4 |
| 7 | 20, 22 March | **Moment generating function (MGF), and probability generating function (PGF) of discrete random variables.** | Ch.4 |
| 8 | 27, 29 March | Special Discrete Distributions( **Bernoulli trial and Bernoulli dist., Binomial dist. , Poisson dist.)** | Ch.4 |
| 9 | 10, 12 Apr. | Special Discrete Distributions(**Hyper geometric dist., Geometric dist., negative binomial dist. )** | Ch.4 |
| 10 | 17, 19 Apr. | **Continuous random variable , cumulative distribution function ,probability density function, expectation, variance , and moments.** | Ch.5 |
| 11 | 24, 26 Apr. | **Moment generating function (MGF) of continuous random variables.** | Ch.5 |
| 12 | 1, 3 May | Some continuous Distributions (**Uniform dist. , Exponential dist. Gamma dist.)** | Ch.5 |
| 13 | 8, 10 May | Some continuous Distributions **(Beta dist., Normal dist.**.) | Ch.5 |
| 14 | 15, 17 May | **Revision** | All Chs |
| 15 | 22, 24 May | **Lab Exam** | |