

Philadelphia University
Department of Basic Sciences and Mathematics

First Semester

Course Syllabus

2014/2015

Course Title	Probability Theory
Course Code	250232
Lecturer	Feras Awad Mahmoud
Office Room	822 (Ext. 2132)
Office Hours	STT: 13:10 – 14:10 and MW: 11:15 – 14:15
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Course Description

This course provides a practical introduction to probability theory. The materials covered in this course represent the corner stone of much of what will be needed in statistical inference in the future. All concepts introduced in the course are illustrated with examples that demonstrate principles. The course covers materials such as Sets, Sample Spaces, Events, Counting Rules, Probability, and Random Variables.

Topics by the Week

Weeks	Topics
1 – 7	Chapter 1: Probability and Distribution. Introduction. Set Theory. The Probability Set Function. Conditional Probability and Independence. Random Variables (Discrete & Continuous). Expectation of a Random Variable. Some Special Expectations. Important Inequalities.
8 – 12	Chapter 2: Multivariate Distributions. Distributions of Two Random Variables. Transformations: Bivariate Random Variables. Conditional Distributions and Expectations. The Correlation Coefficients. Independent Random Variables. Extension to Several Random Variables. Transformations for Several Random Variables. Linear Combinations of Random Variables.
13 – 16	Chapter 3: Some Special Distributions. The Binomial and Related Distributions. The Poisson Distribution. The Γ , χ^2 , and β Distributions. The Normal Distribution.

Course Objectives Upon completion of the course, the student will be able to:

- use counting principles.
- use probability as a tool for addressing random variation and statistical relationships.

- define discrete random variable and use the probability mass function to find probabilities of discrete random variables.
- define continuous random variable and use the probability density function to find probabilities of continuous random variables.
- compute the mean and variance of discrete and continuous random variables.

Learning Outcomes The student will have the knowledge and understanding of how to apply probability concepts and theorems into real world problems. The course also serves as a prerequisite to other statistics courses such as mathematical statistics.

Assessment Distribution

Students will be assessed based on a 100 total marks, which are distributed as follows.

Exam Type	Expected Time	Points Allocated
First	Mon. 17/11/2014	20%
Second	Wed. 24/12/2014	20%
Homeworks	3 at least	20%
Final	(01–09)/02/2015	40%

Textbook and Supporting Materials

- Robert V. Hogg, Joseph McKean, Allen T Craig, **Introduction to Mathematical Statistics, 7th Edition**, Pearson 2013. Call number in PU library: 519.5 HOG.
- Miller & Miller, **John E. Freund's Mathematical Statistics with Applications, 7th Edition**, Pearson 2003. Call number in PU library: Not Available Yet.
- Sheldon Ross, **A First Course in Probability, 9th Edition**, Pearson 2012. Call number in PU library: 519.2 ROS.
- Dennis Wackerly, William Mendenhall, Richard L. Scheaffer, **Mathematical Statistics with Applications, 7th Edition**, Thomson 2008. Call number in PU library: 519.5 WAC.