

# Department of Basic Sciences—Philadelphia University

## Course Syllabus

Course Title	Probability Theory
Course Code	250232
Semester	First/2019–2020
Lecturer	Amin Witno
Office Room	403 Nursing Faculty Building
Office Hours	Sun/Tue/Thu: 11–12; Mon/Wed: 11–12
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## Short Description

This course is an introduction to probability theory, covering standard topics such as sample space, events, counting technique, probability axioms, discrete and continuous random variables and some of their important distributions.

## Topics by the Week

1. Counting techniques: combinatorial methods, binomial coefficients, venn diagrams.
2. Probability: sample spaces, events, probability of an event, rules of probability.
3. Conditional probability, independent events, Bayes theorem.
4. Probability distributions and probability densities: random variables and distributions.
5. Continuous random variables, probability density functions.
6. Multivariate distributions, marginal distributions, conditional distributions.
7. Mathematical expectations: the expected value of a random variable.
8. Moments, Chebyshev's theorem, moment-generating functions.
9. Product moments, moments of linear combinations of random variables.
10. Conditional expectation, Special probability distributions: the discrete uniform distribution.
11. The Bernoulli distribution, the binomial distribution, the negative binomial distribution.
12. Geometric distribution, hypergeometric distribution, the Poisson distribution, multinomial distribution.
13. Special probability densities: the uniform distribution, the gamma distribution, exponential distribution.
14. Chi-square distribution, the beta distribution, the normal distribution.
15. The normal approximation to the binomial distribution, the bivariate normal distribution.

## Recommended Textbook

Miller and Miller, Mathematical Statistics with applications, Eighth Edition, Pearson, 2014.

## Supporting Material

There are no lecture notes. Future hand-outs and supporting materials will be posted at the URL below.

<http://www.philadelphia.edu.jo/math/witno/notes.htm>

## Online Resources

The following shortcut will take you to my web homepage at the University, where you find the course syllabus, exam dates, copies of old exams, links to the above materials, and any important announcement related to the current semester.

<http://phi.witno.com>

## Grade Distribution

Homework	
Quizzes	20%
Class participation	
First Exam	20%
Second Exam	20%
Final Exam	40%

## Exam Dates

Exam dates, once determined, will be posted online at the homepage as well as at the University student-portal page.

## Homework Sets

Homework problem sets with check answers can be downloaded also from the above homepage.