Department of Statistics
Faculty of Economics and Political Science
Cairo University
Spring Semester - 2021

PROBABILITY II (SE203)

COURSE SYLLABUS

PROF. REDA MAZLOUM

Outline

Course Information

Course Name	Probability II (SE203)
Course Prerequisites	Probability I (SE202) Calculus I (SE204)
Course Meeting Times/Place	Monday 9:00 - 10:20 (Online) Wednesday 9:00 - 10:20 (Room 33)
Course Information on BB	Course ID (202102.FEP.SE203) Enroll access code (997016)

Course Objective

- Prepares the student both for courses in statistics and for further study in probability theory through providing the student with a solid basis in:
  1. Continuous probability distributions and its characteristics.
  2. Joint probability distributions (discrete and continuous) and its characteristics.
- Provides the student with an indication of the relevance and importance of the probability theory in solving practical problems in real world.

Course Content

1. Continuous random variables
    - Random variables and their distribution functions
    - Density functions of continuous random variables
    - Expectation of random variables (mean – variance – Expected value of a function of a random variable – Markov inequality – Chebysheve inequality – Moments and moment generating function – Characteristic function)

2. Special parametric families of continuous distributions
    - Uniform distribution
    - Normal distribution
    - Exponential and Gamma distributions
    - Beta distribution
    - Cauchy distribution

Course Content (Cont.)

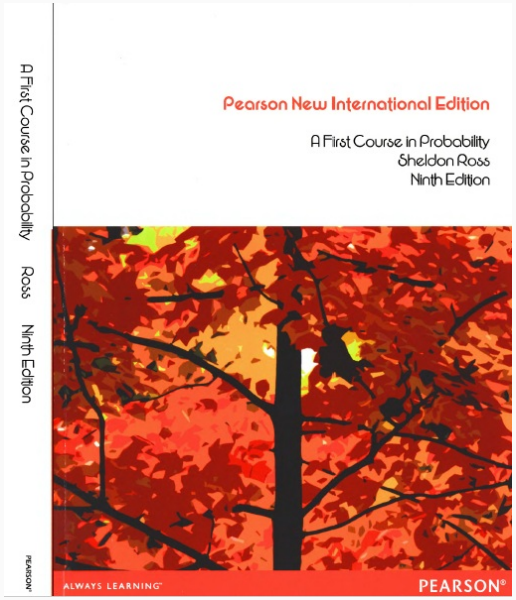
3. Jointly distributed random variables
    - Discrete case (Joint, marginal and conditional distribution/probability functions)
    - Continuous case
    - Expectation (Expectation – Covariance and correlation – Conditional expectation – Joint moment generating function – Independence and expectation – Mean and variance of a linear combination of random variables – Cauchy Schwarz inequality)
    - Special parametric families of bivariate/multivariate distributions (Multinomial distribution - Bivariate normal distribution)

Student Assessment

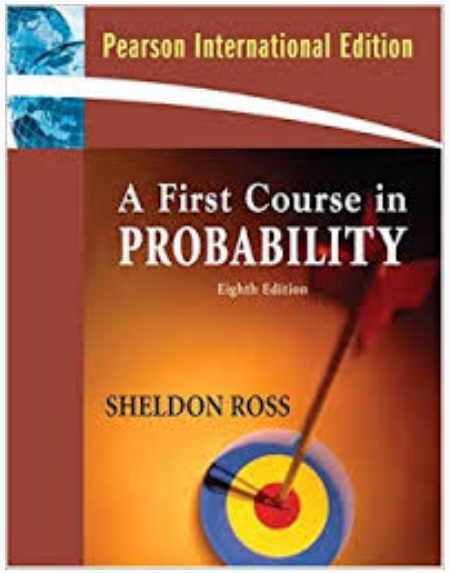
Activities	Grading
Quizzes	18 Points
Project	12 Points
Midterm Exam	20 Points
Final Exam	50 Points

Learning Resources (main Textbook)

- Ross; S. A First Course in Probability. 9th edition, New Jersey: Prentice Hall, 2014 (will be uploaded on BB)



9th edition, 2014



8th edition, 2010

Learning Resources (Further references)

- Hogg; R. V., McKean; J.W., Craig; A. T. Introduction to Mathematical Statistics. 8th edition, New Jersey: Pearson Prentice Hall, 2019.
- Hogg; R. V., Tanis; E. A., Zimmerman; D. L. Probability and Statistical Inference. 9th edition, New Jersey: Prentice Hall Inc, 2015.
- Mood; A. M., Graybill; F. A., Boes; D. C. Introduction to the Theory of Statistics. 3rd edition. New York: McGraw – Hill Book Co., 1974.
- Wackerly; D. D., Mendenhall; W., Scheaffer; R. L. Mathematical Statistics with Applications. 7th edition, California: Duxbury press, 2008.

Instructor Information

Name of Instructor	Prof. Reda Mazloum
Office location	Room 56 – (Old building)
Office hours	Will be informed later (and by appointment)
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