STATISTICS PRE-COURSE

Syllabus

MSc in Economics & MSc in Finance and Banking
University of Rome *Tor Vergata*

September 2020

GENERAL INFORMATION

- **Instructor:** Alfonso Russo
- **Email:** alfonso.russo@uniroma2.it
- **Office Hours:** After class or by appointment.
- **Objectives:** The aim of the preparatory course, held in the first half of September, is to review the fundamental concepts of both descriptive and inferential statistics and to provide students with all the necessary tools to successfully attend the MSc in Economics and in Finance and Banking. Attendance is highly recommended for those students that do not have a strong background in statistics, but it can be a good opportunity to review and deepen the understanding of several key issues for students with solid statistical foundations.
- **Pre-requisites:** Students are assumed to be familiar with undergraduate-level calculus and linear algebra.

Part I : Descriptive Statistics

1. Introduction
2. Types of Data
3. Frequency Distributions
4. Graphical Representation
5. Measures of Centrality
6. Measures of Variability
7. Measures of Association

Part II: Fundamentals of Probability

1. Random Variables
2. Discrete Probability Distributions
3. Continuous Probability Distributions
4. Expected Value and Variance of a Random Variable
5. Main Probability Distributions (Bernoulli, Binomial, Poisson, Uniform, Normal, Exponential, Student-t ...)
6. Basics of Asymptotics (Central Limit Theorem, Law of Large Numbers)

PART III: Statistical Inference

1. Basics of Inference
2. Statistical Modelling
3. Point Estimation
4. Interval Estimation
5. Hypothesis Testing

References

Lecture notes will be available for students. However, the following references are suggested:

- Ross, Sheldon M, *Introduction to probability and statistics for engineers and scientists*, Academic Press, 2014.
- Newbold, P., Carlson, W.L., and B. Thorne, *Statistics for Business and Economics*, Pearson 2012
- Agresti, A., Franklin C., and Klingenberg B., *Statistics: The art and science of learning from data*, Pearson, 2013.