

Sapienza University of Rome

Faculty of Economics

Degree Programs EPOS, FINASS, HE

Probability and Statistics (Preparatory Course)

Academic year 2025-2026 (1-12 September – time 17:00-19:00)

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Course objectives

This is an intensive course of instruction covering the basics of statistics and aim at preparing students for the beginning of classes.

Attendance is not mandatory but **strongly recommended** in order to ensure a common foundation of basic knowledge for all students who will begin regular classes starting September 15.

Pre-course lessons will be delivered **in person** Faculty of Economics Room 1D (6th floor) and online at the [Zoom link](#)

Program

1) Probability Fundamentals:

Experiments, events, sample space.

Axioms of probability, conditional probability, Bayes' theorem.

2) Random Variables:

Discrete (Bernoulli, Binomial, Poisson).

Continuous (Uniform, Exponential, Normal).

Expectation, variance, correlation.

3) Sampling & Central Limit Theorem:

Populations vs. samples.

Sampling distributions of mean, variance, proportion.

Central Limit Theorem and applications.

4) Estimation & Confidence Intervals:

Point estimators and their properties.

Confidence intervals for means, proportions, variance.

5) Hypothesis Testing:

Null and alternative hypotheses, Type I/II errors.

p-values and significance levels.

z-test, t-test, proportion test, chi-square test.

Textbook: A. Agresti, C. Franklin, B. Klingenberg (4th edition). Statistics: the art and science of learning from data. Chapters: 5, 6, 7, 8, 9