Introductory Statistics

Learning outcomes and Course contents

The course will cover the fundamental concepts of statistics and the principles of statistical inference.

By the end of the course, students will be able to: i) manipulate and summarize data; ii) visualize and interpret relationships within data; and iii) apply the most commonly used statistical tests in research.

The student will learn to perform statistical analyses with Excel and interpret the output in the context of the analyzed phenomenon or experiment.

Course contents

- *Descriptive statistics: Displaying and Describing data*
- *Probability and Probability distributions*
- *Estimating with uncertainty: The sampling distribution, the uncertainty of an estimate, Confidence interval*
- *Hypothesis testing: Designing hypotheses, P-value versus Confidence interval*
- *Comparison of Numerical Values: Inference for a normal population, Comparing two means, Comparing means of more than two groups*
- *Contingency analysis: Associations between categorical variables*
- *Correlation and linear regression*

Teaching methods

For each topic covered, the course includes both a theoretical session and a practical session in Excel.

Assessment methods

The assessment will consist of evaluating assignments distributed in class.
A short multiple-choice test will be given at the end of the course

How to attend

The course is aimed in particular at first year PhD students.
Students interested in taking the course are requested to enroll by sending an email with the subject 'PhD course: Introductory Statistics' to elena.bacchelli@unibo.it

Other informations

This course is an introductory course designed specifically for students who have not previously taken a statistics course. For students who have already completed a statistics course during their studies, we recommend a more advanced course.