

# Introduction to Statistics

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## Course objectives

The main goal of this introductory course in statistics is to provide students with a basic knowledge of statistical analysis. This will enable them to successfully fill any gaps related to the subject and approach the subsequent statistics course with the required knowledge. During the five lessons, students will familiarize themselves with elementary statistical methods, from statistical terminology and notation to the analysis and graphical representation of data. Furthermore, lectures will be consistently delivered using an applied approach to encourage students' active participation and understanding of the concepts explained.

## Prerequisites

In order to understand and solve statistical problems, students should have consolidated basic math skills.

## Course content

### 0. Terminology, types of data and variables

- 0.1 Types of data
- 0.2 Measurement scales
- 0.3 Frequency distributions
- 0.4 Descriptive statistics

### 1. Averages and variability indexes

- 1.1 Mean, median, mode
- 1.2 Percentiles, deciles, and quartiles
- 1.3 Standard deviation and variance

### 2. Random variables and distribution moments

- 2.1 Random variables
- 2.2 Sampling distribution
- 2.3 Skewness and Kurtosis

### 3. Probability distributions

- 3.1 Discrete probability distributions
- 3.2 Continuous probability distributions
- 3.3 Standardized scores (*z-scores*)
- 3.4 Boxplot

### 4. Hypothesis testing and intervals

- 4.1 Introduction to hypotheses testing
- 4.2 Z-test
- 4.3 T-test

## Teaching methods

The course content is delivered through lectures, PowerPoint presentations, demonstrations, and practical exercises. Students are expected to participate actively during lectures and solve exercises to develop problem-solving skills. At the end of every lecture, following the explanation of theoretical concepts and practical exercises, there will be time for questions and for testing acquired knowledge.

## Materials and books

- Newbold, P., Carlson, W. and Thorne, B. (2013). Statistics for business and economics. Harlow: Pearson Education.
- Slides and exercises from MS Teams/Moodle.

## Final examination

Students may complete an auto-evaluation test at the end of the course to evaluate their understanding of the covered topics.

## Expected results

By the end of the course, students will be able to:

1. Use proper statistical terminology
2. Apply descriptive statistics techniques
3. Identify, analyze, and visualize data
4. Solve basic probability problems