

## **Data Analysis**

### **B.1.1.2.1**

**Degree: Bachelor**

**Year: 2**

**Semester: 3 (Fall) and 4 (Spring)**

**General workload: 8 ECTS credits, 288 hours**

#### **Goals and objectives of the course**

To acquire basic theoretical knowledge of probability theory and mathematical statistics; to acquire the ability to use data (including Big Data) processing techniques and machine learning to solve applied problems related to financial services.

#### **Key didactic units**

- Data in the economy, their visualization and pre-processing
- Random events
- Random quantities
- Limit theorems of probability theory
- Assessment of parameters
- Statistical hypotheses testing
- Dispersion analysis
- Fundamentals of nonparametric statistics
- Fundamentals of machine learning

#### **Place of the discipline within the curriculum**

The course is part of the computer science and mathematics module (information module) of mandatory disciplines within the curriculum of program 38.03.01 in Economics.

#### **Upon completing the course, the students should:**

*Know:*

- Basic concepts of probability theory and mathematical statistics; calculation techniques used in data analysis; probabilistic and statistical methods
- Key methods of applied statistics and machine learning
- Key methods of probability theory, mathematical and applied statistics used in economics and finance
- Methods for estimating points and intervals of the parameters of random variables distributions, statistical hypotheses testing techniques.
- Basic principles of pre-processing, data visualization and analysis, probabilistic and statistical methods

*Be able to:*

- Use descriptive statistics and data visualization tools, probabilistic and statistical methods for solving standard problems
- Use applied statistics and machine learning methods to solve applied economic problems

- Use probabilistic and statistical methods to solve standard professional financial and economic problems, interpret the results obtained
- Make point and interval estimates of financial and economic indicators as parameters of random variables distributions, test statistical hypotheses related to financial and economic indicators
- Use descriptive statistics and data visualization tools, probabilistic and statistical methods for solving applied economic problems

*Have:*

- Skills in Microsoft Excel use
- Skills for solving standard problems
- Skills for solving applied economic problems
- Skills for solving standard professional financial and economic problems
- Skills for examining financial and economic indicators

**Course structure:** lectures; practicals and seminars, interactive classes

**Summative assessment:** pass/fail examination (autumn semester) and examination (spring semester)