

# Data Science Techniques and Real-World Applications

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## Syllabus / Agenda

### Day 1 (11.09.25):

- Python programming
  - Introduction
  - Modularity & Libraries
  - HW – 01: EV
- Data science toolkit
  - NumPy & Pandas
  - HW – 02: Monte Carlo Simulation
- Data Wrangling (ch2. Data Analytics for Business, Economics, and Policy)
  - Understand types of variables and observations;
  - Clean & organize data in a tidy way;
  - Merging tidy tables
  - HW – 3: Markowitz Efficient Frontier

### Day 2 (18.09.2025)

- Exploratory Data Analysis (ch3. Data Analysis for Business, Economics, and Policy)
  - EDA
  - Auto EDA tools
  - Visualizations
  - Tips and Libraries
  - HW – 4: Hotels Europe Compare
- Data Acquisitions
  - APIs

### Day 3 (25.09.2025)

- Predictive Modelling, Regression Analysis, and ML techniques
- Guest Speaker

**Day 4 (02.10.2025)**

- Your presentations

**Day 5 (09.10.2025)**

- SQL
- Relational Database
- Database Management System
- SQL Alchemy (or whatever IDE we are using)

**Day 6 (16.10.2025)**

- Causality
- A case study