



Universidad  
de Navarra

*Data Analytics project\_20 (F. Económicas)*

*Guía docente 2023-24*

## PRESENTACIÓN

Every single aspect of our lives is being transformed by increasing amounts of data being generated and analyzed. In particular, data is used to create and evaluate public policy. In this course, we will give a critical presentation of data science approaches in evidence-based public policy. The goal is to learn how to reason in terms of data science, from infrastructure to ethics.

The course aims to be at an introductory level in data science. Examples will be used throughout the lectures, and students are encouraged to discuss these examples in class.

- **Type:** Elective (Mandatory for Data Analytics students)
- **ECTS:** 1.5
- **Course and Semester:** 2nd course, 2nd semester.
- **Language:** Español
- **Module and subject matter:** Module 7, subject matter 7.2
- **Professors:** Christine Choirat & Bertrand Loison
- **Schedule:** TBA
- **Room:** TBA

## COMPETENCIAS

Upon successful completion of this course, students should:

- Understand what is Data Science for Public Policy
- Know the steps of Data Science and Public Policy processes
- Be exposed to the infrastructure required to leverage data science tools in public policy
- Be familiar with data science and big data concepts, data visualization techniques, data analytics methods
- Be aware of the ethical challenges surrounding the use of data science in public policy

Specific Competences

- CEOP1. Accessing and managing massive data.
- CEOP3 Working with visual elements that provide insights and an understanding into complex concepts and components of economic and/or business problems
- CEOP4. Identify patterns and trends and gather useful information from massive data in economics and/or business.
- CEOP5. Effective communication of results to a professional audience in economics and/or business

## PROGRAMA



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### **Module 1: What is Data Science for Public Policy?**

Data Science; Public Policy; Data Science for Public Policy; Data Science for evidence-based Public Policy; Examples and Use Cases.

Making decisions in the face of uncertainty: Value and the limits of analytics (descriptive, predictive and prescriptive); Value and the limits of Knowledge (deductive and inductive approaches); Value and limits of data and how it can lead to informed decisions; Examples and Use Cases.

Steps and goals of the analytics workflow, discuss problem structuring, and its importance; Basic criteria to judge quality of a data-related questions; Basic summary tactics used to familiarize yourself with a dataset; Examples and Use Cases.

### **Module 2: Data Science & Public Policy Processes**

Case study 1: The role of Data Science in Immigration Policy

Case study 2: The role of Data Science in Healthcare Policy

### **Module 3: Data Science Infrastructure**

The basic concepts of IT Infrastructure: centralized, decentralized, cloud, edge computing, etc.; The Implications of edge computing (IOT) and edge analytics regarding pushing computing out; Links between public policy and infrastructure regarding data sovereignty; Homomorphic Encryption; Examples and Use Cases.

The basic concepts of Knowledge Creation: Knowledge Graphs and Data Science; FAIR Data Principles (*findable, accessible, interoperable, reusable*) and Data Science; Examples and Use Cases.

### **Module 4: Data and Big Data**

Data and Big Data Fundamentals: Data, Metadata, Data Interoperability, Data Classification; Data Quality; Big data Fundamentals: The 4 and 5 V's of Big Data (volume, variety, velocity veracity and value); Representativity of Big Data; Record linkage; Examples and Use Cases.

### **Module 5: Data Analytics**

Introduction to Data Analytics: Exploratory Data Analysis; Regression Analysis; Framing Classification; Quantitative Perspectives; Prediction; Cluster Analysis; Natural Language; Examples and Use Cases.

### **Module 6: Data Visualization**



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Case study 1: Data Visualization Techniques

Case study 2: Covid 19 Dashboard

### Module 7: Ethics in Data Science

Four Principles of Ethics in Data Science: Respect for Persons, Beneficence, Justice, and Respect for Law and Public Interest; Two Frameworks of Ethics in Data Science: consequentialism and deontology; Data Re-Identification; Examples and Use Cases.

## ACTIVIDADES FORMATIVAS

- Theoretical/Practice classes
- Group projects (at the end of the subject)

## EVALUACIÓN

Both in May and June.

- Those who attended all the classes:

Final mark = 2 + 0.8\* Presentation

- Partial attendance + at least 6.5/10 in the Presentation:

Final Mark = 5/10

## HORARIOS DE ATENCIÓN

Send email to:

Dra Christine Choirat ([cchoirat@external.unav.es](mailto:cchoirat@external.unav.es))

## BIBLIOGRAFÍA

Lectures will provide class material and readings.