

Ph.D. in “Regional Science and Economic Geography” Academic Year 2021/22

DATA VISUALIZATION AND MAPPING

Optional Methodological Course: 20 hours TERM II

Convenor: Prof. Ugo Rossi, GSSI (ugo.rossi@gssi.it)

Lecturers:

Prof. Filippo Celata, Professor of Economic Geography, University of Rome La Sapienza (filippo.celata@uniroma1.it)

Dr. Alice Corona (TBC)

Prof. Rachel Franklin, Professor of Geographical Analysis, University of Newcastle, UK (rachel.franklin@ncl.ac.uk)

1. Objectives of the course

The course will enable students to develop theoretical and practical skills about how to process and visualize data through charts, graphs and maps. It will introduce participants to how to use data visualization and practice mapping in their research and to communicate the results of their research. The course will look into the most relevant tools, techniques, and software, with a particular focus on spatial data analysis.

- *Main research questions of the course:*

- What is Data Visualisation and Physicalisation?
- Why and how to visualize social science research?
- What data and spatial patterns tell about social processes?
- How to access and use unconventional (geo)data sources?

- *List of main lecture topics:*

- Use and analysis of visual data in research;
- Learning digital fabrication skills;
- Data visualisation and mapping in urban studies and regional science;

- Geographic information systems and geodata processing;
- Spatial statistics and exploratory spatial data analysis;
- References and principles for creating informative data visualizations and maps;
- Ideas for integrating data visualisation into research;
- Overview of the main software and visualization tools.

2. Course structure

The course is organised in lectures, labs, and seminars.

Dr Alice Corona (TBC) will introduce a variety of conceptual and practical issues concerning data science and data visualisation, presenting examples, tools and techniques adopted over time to convey information in research. During the lab students will be asked to adopt and adapt an infographic.

Prof. Rachel Franklin will teach introductory cartography, geographic information systems and spatial analysis, with a pedagogic orientation towards policy applications and the social sciences and humanities.

Prof. Filippo Celata will focus on geodata sources, spatial data processing and analysis, geographical patterns and spatial statistics.

Lecture topics:

Session type	Lecturer	Topic
Lecture/lab 3 hours	Alice Corona (TBC)	Data science and data visualisation: concepts, practices and tools
Lecture/lab 3 hours	Alice Corona (TBC)	Data visualisation and physicalisation: examples and techniques
Lecture/lab 4 hours	Rachel Franklin	GIS for Regional Science & Economic Geography Applications Importing and visualizing data GIS Functionality Basic Cartography
Lecture/Lab 4 hours	Filippo Celata	Conventional and unconventional geodata sources; Spatial scales, geometries and partitions; Georeferencing and geocoding
Lecture/lab 3 hours	Rachel Franklin	Common GIS Methods and Tools Creating Spatial Variables Density Measures Exploratory Spatial Statistics; Independent Map Creation and Discussion
Lecture/Lab 3 hours	Filippo Celata	Spatial patterns; spatial clustering; Spatial autocorrelation; Introduction to spatial interpolation and regressions