UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

# Geographic Information Science for Social Research

**2324-1-F4901N120**

## Learning objectives

*Knowledge and understanding*
Offer a general introduction to the use of GIS in the territorial social sciences by providing students with the main theoretical, conceptual and methodological knowledge relating to Geographic Information Systems and the use of sources, software and techniques for analyzing spatial data in social research.

*Applying knowledge and understanding*
Knowing how to use the concepts and models of Geographic Information Science, the sources, softwares and techniques for analyzing spatial information to describe and analyze socio-territorial phenomena and processes.

## Contents

Geographic information science aims to provide methods and tools to transform spatial information into maps that describe and analyze the problems we want to study. The GIS (Geographic Information System) are a set of IT tools for the management, representation and analysis of geographic data that are increasingly widespread for analyzing the territory and in social research, for planning and territorial marketing and which have generated an impressive economic and new professionals. The course represents an introduction to geographic information science and to the use of spatial data and GIS in territorial social sciences. After a historical-conceptual-methodological introduction, students will be familiarized with GIS and spatial analysis through exercises related to the collection, analysis, interpretation and cartographic representation of spatial and territorial data.

## Detailed program

The course is organized in three main parts.

In the first, historical-introductory, the use of spatial information and mapping in the social sciences will be deepened: from the Cholera maps of J. Snow and the poverty maps of C. Booth to E. Durkheim's suicide mapping and the ecological analysis of the Chicago School up to the birth of GIS and GPS in the 60s and 70s of the last century and the most recent fields of application and research through open and big data and quantitative, qualitative and participatory approaches.

The second, theoretical-conceptual, will address the following topics: the most widespread GIS data models (vectors and raster), the spatial or coordinate reference systems, the types and formats of spatial data, the primary and secondary sources of spatial data (in particular open data), GIS software and applications (Esri ArcMap and QuantumGIS). Particular attention will also be paid to the quality and comparability of spatial data and of the units of analysis at the local, national and international scale.

In the third part, of a workshop nature, students will be introduced with guided, group and individual exercises to spatial representation and analysis, that is to the tools that allow to interpret the distribution of phenomena in space from various points of view. In particular, attention will be paid to the definition of appropriate research designs, to the methodological aspects related to the construction of indicators and indexes, to the cartographic representation of information and to the creation of maps for socio-territorial and tourism research.

## Prerequisites

No specific prerequisite, except those decided in the Didactic Regulation.

## Teaching methods

Lectures, exercises, group works.

## Assessment methods

*Attending students:*
Development of a group work (project work) that will be presented at the end of the course and final paper, by each student, on the topic of the project work.
Evaluation criteria include: active participation of students during the course; content knowledge; language skills; ability to synthesise; ability to use the knowledge acquired; critical skills to analyse phenomena; and ability to applying theoretical concepts to empirical cases.

*Non-attending student:*
Written exam (open questions + closed-ended test to verify knowledge of fundamental concepts + exercises that require the application of specific principles or techniques).
The evaluation criteria are as follows: 1. Knowledge of the contents of the exam program; 2. Communication skills in the disciplinary context of reference (correct use of language and ability to synthesize information); 3. Disciplinary problem solving skills and ability to re-elaborate the acquired knowledge.

## Textbooks and Reading Materials

Bearman, Nick (2021). *Gis : Research Methods*. London, UK: Bloomsbury Academic. https://unimib.on.worldcat.org/oclc/1176324481

Boffi, Mario (2004). *Scienza Dell'informazione Geografica : Introduzione Ai Gis*. Bologna: Zanichelli. https://unimib.on.worldcat.org/oclc/799659942

Steinberg, Steven J., and Sheila L. Steinberg (2006). *Geographic Information Systems for the Social Sciences: Investigating Space and Place*. Thousand Oaks, CA: SAGE Publications. https://unimib.on.worldcat.org/oclc/781260886

## Sustainable Development Goals

NO POVERTY | GOOD HEALTH AND WELL-BEING | DECENT WORK AND ECONOMIC GROWTH | INDUSTRY, INNOVATION AND INFRASTRUCTURE | REDUCED INEQUALITIES | SUSTAINABLE CITIES AND COMMUNITIES | RESPONSIBLE CONSUMPTION AND PRODUCTION | CLIMATE ACTION | LIFE ON LAND