UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Geographic Information Science for Social Research

2526-1-F4902N008

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. This objective will be assessed, in particular, through written tests and ongoing assessments.

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. This objective will be assessed during the exercises, the project work and the written test.

Making judjments
Be able to critically analyse sources, methods and techniques related to GIS and independently rework the spatial thinking acquired to other cases, ontexts, and issues. This objective will be assessed through project work and open questions in written tests.

Communication skills
The ability to communicate effectively within the relevant subject area, including written and oral language skills and the ability to summarise. This objective will be assessed through active participation in teaching activities, written tests, and the presentation and drafting of final project work.

Learning skills
The ability to orient oneself and continue studying independently beyond the classroom, building a toolbox of concepts, methods, tools and resources to support further study of the use of GIS in social, territorial and tourism sciences. Active participation in teaching activities and project work will be used to assess the achievement of this objective.

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 and project works 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, AI, 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 (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, to the creation of maps for socio-territorial and tourism research, and to the role of new AI-related tools.

Prerequisites

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

Teaching methods

The course consists of 56 hours, of which:

- 24 hours of in-person teaching (lectures with slides, audio and video);
- 32 hours of interactive classroom teaching (In particular: 16 hours of guided group and individual exercises; 16 hours of project work development under the supervision of a teacher and tutor).

Assessment methods

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.

Alternatively, students may: a) take an in itinere test relating to the first two parts of the course, which includes open-ended questions; b) develop an individual project work that will be presented at the end of the course; c) write an individual report on the theme 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.

The criteria for grading are as follows:

- Insufficient: 1-17
- Sufficient: 18-23
- Fair: 24-26
- Good: 27-28
- Very good: 29-30
- Excellent: 30 with honours

Textbooks and Reading Materials

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

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

Any other texts and materials will be indicated on the course page.

Sustainable Development Goals

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