



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Big Data in Geographic Information Systems

2021-2-F9101Q024-F9101Q024M

Learning objectives

The aim of the module is to enable students to have a basic competence to manage and analyze georeferenced data.

Contents

Module 1: Introduction to geospatial data

Module 2: Observational data in climate sciences

Module 3: Climate models

Module 4: Analysis of climate data

Module 5: Wrap-up and student projects

Detailed program

The frontal lessons (2 hours per module) will present some background on the field of application, with specific attention to the relation between the data and the system that generated them, providing the theoretical tools for their management.

The practical sessions (3 hours per module) will provide the software tools for geospatial data handling, visualization and analysis. Python will be used for examples shown by the teacher and for students individual or group exercises. Small assignments are foreseen, due by the last week of classes.

Module 1 will introduce the topic of geospatial data, including data types, and basic concepts related to cartography and Geographic Information Systems.

In Modules 2-4 examples and applications will be drawn from the domain of climate science. Different geospatial data types will be presented, including from observations of the physical world (M2) and from computer model simulations (M3), each characterized by different features and challenges. Integrated data analysis applications, ranging from simple hypothesis testing to space-time pattern recognition, will be introduced (M4).

A review of the main concepts will be carried out in Module 5, along with correction of the assignments, and questions from students; at this time, the students will also have the opportunity to start working on their individual projects for the final examination.

Prerequisites

Basic knowledge of Python.

Teaching methods

Frontal lessons and practical laboratory sessions.

During Covid-19 emergency phases classes will be held remotely (asynchronous format), with some "live" remote events.

Assessment methods

Oral exam: 50% presentation and discussion of a final individual project, 50% topics and assignments from the course.

Textbooks and Reading Materials

Teacher slides; links to scientific papers and webpages. Distributed via elearning.

Semester

Second semester

Teaching language

Italian; slides and learning material in English.
