UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Geographic Information Systems (gis)

2425-3-E3401Q056

Aims

The aim of this course is to provide the student with a basic knowledge of the use of geographic information systems (GIS) for the analysis and processing of georeferenced data. The course addresses the GIS theme in a practical way and allows the student to learn the use of the open-source geographic information system application QGIS. The lessons will take place mainly in the computer classroom and the teacher will guide each individual participant in learning the GIS software.

In particular, the course will provide the student with the ability to manage spatial data in digital format and the ability to return cartography maps.

Contents

Principles and applications of Geographic Information Systems (GIS) for the analysis and modelling of spatial data in geological studies.

Detailed program

Overall objectives

The course aims at providing the students with the main theoretical and methodological knowledge of the use of GIS in geological studies.

Contents of lectures

Introduction to SIT: definition, main functionalities and illustration of the main fields of application in geology.

Principles of cartography: short history of cartography, reference systems, geographic projections, Italian Cartography.

Spatial data representation through computer systems.

Database definition, database models, spatial databases.

Introduction to the QGIS software: QGIS user interface and project, data formats. Management of vector and raster layers. Attribute tables and queries. Layer editing and digitalization techniques. Georeferentiation. Data rendering and layout elaboration.

Geoprocessing: main techniques of vector geoprocessing, spatial queries, raster geoprocessing.

Statistical surfaces and digital elevation models (DEM): statistical surfaces, DEM, DEM-based morphometric analysis.

Examples of the use of GIS in geological applications.

Laboratory contents

Application of the open-source software QGIS for the implementation of the techniques presented during the course. The tecniques will be applied to solve geological problems.

Prerequisites

Teaching form

Lessons (4 credits)
16 two-hour lectures, in person, Delivered Didactics

Laboratories (2 credits)
8 three-hour lab activities, in person, Interactive Teaching using virtual computer laboratories

Textbook and teaching resource

Handouts and slides

Noti, Valerio. "GIS Open Source per geologia e ambiente-Analisi e gestione di dati territoriali e ambientali con QGIS." *Dario Flaccovio Editore, Palermo* (2014): 71-91.

Semester

first semester

Assessment method

The exam allows to evaluate the preparation reached in terms of theoretical and practical knowledge of the topics covered during the lessons and the laboratories. This knowledge is evaluated with a theoretical and practical examination based on a GIS exercise in computer lab.

The evaluation of the examination is established through the resolution of problems on geological topics with QGIS software and with open questions which allow to verify both the knowledge of the theoretical fundamentals given in the course and the student’s skills to apply the theoretical foundations to practical cases. The expositive ability and adequacy of the student's language is also assessed. The examination is retained positive for an evaluation of 18-30/30.

An additional oral examination may be taken at the student's request if a minimum grade of 18/30 is achieved in the written exam. The oral examination will focus on the discussion of the written test and the topics covered in the lectures.

Office hours

During working hours with email appointment to micol.rossini@unimib.it

Sustainable Development Goals

INDUSTRY, INNOVATION AND INFRASTRUCTURE