UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

## Geographic Information Systems

**2627-2-E3202Q008-E3202Q00802**

### Aims

At the end of this teaching the student will have to:

- know the basic principles of SIT

- know the main SIT data models and their basic applications

Ability to apply knowledge and understanding

- be able to create a spatial database

At the end of the course, the student will be able to make a judgment:

- on the correct application of the knowledge acquired during the course for the management of spatial data

- on the quality and accuracy of spatial data;

At the end of the course the student must know:

- organising and managing spatial data

- be able to create an operational flow for the acquisition, management, processing and representation of spatial data.

### Contents

The course regards the principles of Geomatic and in particular application of Geographic Information Systems to

environmental geology

## Detailed program

General Objectives

The course aims to provide students with the main knowledge base and methodology underlying the GIS databases. Jointly presenting the main fields of application in environmental and land.

Contents of lectures

Definition of SIT, illustrations of the application in the fields of environmental and land. Elements of basic cartography; characterization of geographic information. Definition of spatial data models. Mode of representation of spatial data through computer systems. Hardware and software architecture and presentation of the main features of a GIS. Definition of database, model database, relationships between databases and GIS. Method of gathering data, creating spatial data base. Classification and main applications of the analytical capabilities of a GIS and GIS mapping ratio, mode of production and representation of thematic maps. Basic concepts and definition of data quality, metadata definition and functionality.

Contents of the workshops / tutorials with practical exercises using industry-leading commercial software applications with on case studies.

## Prerequisites

Basic knowledge of cartography acquired through first-year courses and the cartography lab
MANDATORY ATTENDANCE AT LABORATORY SESSIONS

## Teaching form

16 Lessons by 2 hours, 4 credits, (32 hours) Delivered Didactis

7 Laboratory experiences (LIBaaS) (6 by 3 hours, 1 by 2 hours) , 2 credits, (20 hours) - Interactive Teaching
In the lab, we will use the virtual machines provided by the university's LiBAss service

## Textbook and teaching resource

- Federica Migliaccio,Daniela Carrion, *Sistemi informativi territoriali*, UTET Università
- Paul A. Longley, Michael F. Goodchild, David J. Maguire and David W.
- Rhind, *Geographic Information systems and science,* John Wiley & Sons, 2001
- Burrough P., McDonnell R., *Principles of Geographical Information Systems*, Oxford University Press, 1998
- Paul A. de By (editors), *Principles of Geographical Information Systems*, ITC Educational Textbook Series, International Institute for Aerospace Survey and Earth Sciences, - Enschede, 2000, (http://www.gdmc.nl/oosterom/PoGISHyperlinked.pdf)

- Valerio Noti , *GIS Open Source per geologia e ambiente*, Dario Flaccovio Editore
- Luca Casagrande - Paolo Cavallini - Alessandro Frigeri - Alessandro Furieri - Ivan Marchesini -Markus Neteler, *GIS Open Source*, Dario Flaccovio Editore
- G. Amadio, *Introduzione alla Geomatica*. Dario Flaccovio Editore, 2012
- Boffi, Scienza dell'informazione geografica. *Introduzione ai GIS*, Zanichelli
- C. Pesaresi, *Applicazioni GIS*, Utet Università
- A. Favretto, *Strumenti per l'analisi Geografica GIS e telerilevamento*, Patron Editore

## Semester

first semester

## Assessment method

Practical test on laboratory activities during the last lesson
Students will not be admitted to the exam unless they have attended at least 75% of the lab hours, as specified in the academic regulations.

- written examination consisting of 6 open-ended questions on the theoretical part only

Oral by choice

**Examination evaluation:**
The grade for the written test will also be determined taking into account the practical test paper

- The final grade is between 18-30/30

## Office hours

to be agreed with the lecturer by e-mail

## Sustainable Development Goals

QUALITY EDUCATION | INDUSTRY, INNOVATION AND INFRASTRUCTURE