UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Informatics for Environmental Data Analysis

2526-3-E3201Q117

Aims

The course content is designed to provide students with the fundamental knowledge necessary to design and compile frameworks for the analysis of environmental data.

Specifically, the course aims to:

- explore, manage, and manipulate datasets of environmental data (including physical, chemical, meteorological-climatic, geological, biological, and ecological data), whether observational or experimental in nature
- compute descriptive statistics
- graphically represent data distributions
- identify the appropriate statistical analysis to answer specific scientific questions based on the data collected or available
- graphically present results and interpret their meaning

Contents

Exploration, management and handling of environmental datasets; analysis and graphical representation of data using an IT approach and interpretation of results.

Detailed program

In detail, the course will deal briefly from a theoretical point of view, and more extensively from a practical point of view, the following topics:

- Exploration and manipulation of data
- Graphical representation of data
- Analysis of data with normal distribution by means of linear models.
- Analysis of data with non-normal distribution by generalized linear models
- Data mining
- Spatially explicit models

Prerequisites

Basic statistics concepts acquired through the course "Mathematics and Statistics"

Teaching form

The teaching activity will be organized in lectures (8 hours of Delivered Didactics) and practical activities (50 hours of Interactive Teaching).

Four-hour lectures, in person, Delivered Didactics

- Frontal lesson, overall 1 credits, 8 h.

Three- four-hour lab activities (LIBaaS), in person, Interactive Teaching

- Activities in wired classroom, overall 5 credits, 50 h.

Textbook and teaching resource

An illustration of the textbooks, with their characteristics, will be provided during the first frontal lesson. Between these:

Justin C. Touchon. Applied Statistics with R. A Practical Guide for the Life Sciences.
Oxford University Press (2021) - Consigliata la versione e-book

Semester

The lectures and the practical part will be delivered in the third year of the course in the first semester.

Assessment method

Written exam: problem-solving tasks to be carried out in a computer-equipped classroom.
The task will be aimed at assessing students' disciplinary problem-solving skills. During the exam, students may

consult notes taken during lectures or practical sessions, textbooks, and online resources.

Oral exam: discussion based on the written exam.
Passing the written exam grants access to a brief oral exam aimed at verifying the level of knowledge, skills, and the student's ability to explain the concepts addressed in the written test, as well as those covered during lectures and practical sessions.

A total of 7 official exam sessions are scheduled during teaching breaks.

Office hours

By appointment upon request at the e-mail addresses:
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Sustainable Development Goals

LIFE BELOW WATER | LIFE ON LAND