



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Telerilevamento per le Scienze della Terra

2021-2-F7401Q102

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#### Aims

The aim of the course is to provide expertise in the analysis and interpretation of remote sensing images for Earth Sciences applications.

#### Contents

Theory and practice for remote sensing data analysis using commercial and open-source software for image processing for geological applications.

#### Detailed program

Basis of remote sensing: electromagnetic spectrum, optical, thermal, lidar and microwave (radar) remote sensing, radar interferometry, characteristics of active and passive remote sensing instruments and platforms (e.g. ESA – Sentinels satellites).

Data elaboration and image analysis: satellite image visualization; pre-processing techniques; image processing and extraction of biogeophysical parameters.

Applications: 1) reflectance spectroscopy for the analysis of mineral and rock composition; 2) monitoring of the cryosphere (e.g. glaciers, rock glaciers) with active and passive remote sensing techniques; 4) monitoring of hydrological instability with satellite images.

Laboratory exercises: use of commercial (e.g. ENVI – Harris geospatial solutions) and open-source (e.g. ESA-SNAP, QGIS) software for geological applications using the abovementioned techniques. The exercises are a key part of the course and will be held using computer labs.

## **Prerequisites**

## **Teaching form**

Laboratory (4 credits)

*During the Covid-19 emergency, lectures will take place in a mixed mode including remote asynchronous lessons, recorded tutorials made available online and live exercises through video conference systems.*

## **Textbook and teaching resource**

Handouts and slides

Brivio, P.A., Lechi, G., and Zilioli E., 2006. Principi e metodi di Telerilevamento, De Agostini - Città Studi edizioni, Torino (Italy), pp. 525.

## **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.

The evaluation of the examination is established through an oral examination 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 the resolution of problems on geological topics.

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.

*During the Covid-19 emergency the exams will be online and will be conducted using the Webex platform. A public link to the examination will be reported on the e-Learning page of the course.*

## **Office hours**

During working hours with email appointment to [micol.rossini@unimib.it](mailto:micol.rossini@unimib.it)

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