



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Tectonics and Structural Geology

1920-1-F7401Q101

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#### Aims

The course includes 42 hours of lessons, 12 hours of laboratory activities and 10 hours of field activities. Aim of the course is to introduce students to the study of the different geodynamic environments through a structural approach based on the analysis of tectonic structures. The main emphasis will be on active margins and orogenic belts. General principles and theoretical models will be discussed, as well as several case studies chosen in the Alpine-Himalayan belts and in the Mediterranean region. Advanced exercises on stereographic projections, the construction of complex geological cross sections, mesoscopic structural field analyses will be the subject of practical activities in laboratories. A short fieldtrip in the Alps will be carried out at the end of the course. A tutor will be present during fieldwork.

#### Contents

Analysis of the main brittle and ductile structures and of the associated deformation mechanisms. Complex structural associations in the different geodynamic context at a lithospheric scale, with reference to the Alpine, Mediterranean and Himalayan regions. Introduction to mesoscopic structural analyses and to the geology of the Alps.

#### Detailed program

Rocks rheology: elastic deformation, brittle and plastic behaviour, intracrystalline plasticity and associated tectonic structures; lithosphere and asthenosphere. Plate motions; continental break-up, rifting and ocean spreading; oceanic ridges and transform faults, subduction zones and accretionary wedges, forearc and back-arc basins; ophiolites, obduction and continental collision, intracontinental transform faults; continental indentation and post-orogenic extension.

The use of stereographic projections in fold and fault analyses and the construction of complex geological sections related to different deformational environments will be carried out during practical activities. A final field excursion in the Alps will be devoted to mesoscopic analyses and to the general structure of the belt.

## **Prerequisites**

Fundamentals of structural geology and tectonics. Fundamentals of Plate Tectonics and of Petrology. Use of specific software in a windows environment.

## **Teaching form**

- Lessons (42 hours)
- Laboratory experiences (12 hours)
- Field activity (10 hours)

## **Textbook and teaching resource**

- **Fossen H. Structural Geology. Cambridge University Press 2010 and e-learning materials (free on line).**
- **Kearey Ph., Clapeis K.A. and Vine F.J., 2008. Global Tectonics (third edition). Wiley-Blackwell, 482 pp.**
- **Handouts and materials in a digital format (pdf).**
- **Scientific papers.**

## **Semester**

2nd semester 01-03-2020 - 10-06-2020

## **Assessment method**

- Oral examination including the interpretation of stereoplots representing brittle and/or ductile structures
- Short report on field activity

- Students are encouraged to give an oral presentation. The subject will be chosen with the lecturer.

### **Office hours**

Monday 14-16 or by appointment (e-mail [andrea.zanchi@unimib.it](mailto:andrea.zanchi@unimib.it); tel 02-64482028)

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