UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Tectonics and Structural Geology

2627-1-F7402Q002

Aims

The course includes 42 hours of lessons (21 two-hour lectures, in person, Delivered Didactics), 12 hours of laboratory activities (6 two-hour lab activities, in person, Interactive Teaching) and 12 hours of field activities (2 six-hour field activities, in person, Interactive Teaching). 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. 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, focal mechanisms, and mesoscopic structural analyses performed in the field during two days of activities will be the subject of practical activities in laboratories. Field activity is focused on the analysis of mesoscopic structures in atwo different areas of the Alps.

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 Apine, Mediterranean and Himalayan regions. Introduction to mesoscopic structural analyses.

Detailed program

Rocks rheology: brittle and plastic behaviour, intracristalline plasticity and associated tectonic structures; lithosphere and astenosphere. Plate motions; continental break-up, rifting and ocean spreading; oceanic ridges and transform faults, intracontinental transform faults; fold-and-thrust belts.

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. Two field trips in the Alps will be devoted to mesoscopic structural analyses ofbrittle and ductile structures.

Prerequisites

CORSO DI SICUREZZA SUL TERRENO (status "Approved")

Teaching form

Lessons: 21 two-hour lectures, in person; Delivered Didactics (42 hours)

Laboratory experiences: 6 two-hour lab activities, in person; Interactive Teaching (12 hours)

Field activity: 2 six-hour field activities, in person; Interactive Teaching (12 hours)

Textbook and teaching resource

- Reference book

- **Fossen H. Structural Geology. Cambridge University Press 2010 and e-learning materials (free on line).**
  Suggested books
- **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.**
    - **Fossen H. and Teyssier, 2024 Plate Tectonics Cambridge University Press**

Semester

1st semester 1-10-2026 - 31-1-2027

Assessment method

1. Written exam on the interpretation and discussion of stereographic projections representing brittle and/or ductile structures, as well as earthquake focal mechanisms.

2. Written/oral exam covering the topics addressed during the lectures. The written exam may be divided into two parts.

3. Submission of a written report based on the data collected during the two days of fieldwork carried out as part of the Campus Abroad activities.

Assessment is based on the weighted average according to the credits (CFU/ECTS) assigned to the different activities (6 + 1 + 1).

Office hours

Monday 14-16 or by appointment (e-mail andrea.zanchi@unimib.it; tel 02-64482152)

Sustainable Development Goals

QUALITY EDUCATION | AFFORDABLE AND CLEAN ENERGY | RESPONSIBLE CONSUMPTION AND PRODUCTION | LIFE ON LAND