



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Geology of Sedimentary Basins

2425-1-F7401Q001

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#### Aims

Ability to analyze the different types of sedimentary basins associated with the different margins defined by the theory of Plate Tectonics. Knowledge of subsidence mechanisms. Analysis of different types of sedimentary processes (eg accretion and tectonic erosion). Classical models to explain the formation of sedimentary basins and their alternatives.

#### Contents

The different subsidence mechanisms (Rifts, passive margins, trenches). Sedimentary basins in divergent plate boundaries. Passive rifts and active rifts. Sedimentary basins in convergent plate boundaries. Basins associated with oceanic subduction and continental subduction. Accretion and tectonic erosion. Sedimentary basins associated with orogens. The flexural model of a sedimentary basin. Alternative models.

#### Detailed program

Introduction and subsidence. Subsidence mechanisms. Basins in divergent margins. Basins associated with oceanic subduction. Basins associated with continental subduction. Subsidence mechanisms (rifts, passive margins, trenches). Subsidence linked to subduction and conclusion. Basins associated with divergent plate boundaries – introduction. Passive rifts and active rifts. Rift: hyperextended geometries and margins. The African Rift System. The Red Sea tectonics and magmatism. Gulf of Suez and the Levant. Sedimentation in rift basins. Aborted rifts and intracratonic basins. Passive margins and oceanic basins. An alternative model – introduction. Alps and Apennines. E and W subductions. Oceanic subduction – introduction. Accretion and tectonic erosion. Exhumation, mélangé and start of subduction. Sedimentary processes - trench-slope trenches and basins. Forearc basins – introduction. Forearc basin successions - Tibet & California. Arc-trench systems – Andes, Sunda, Alaska

and Barbados. Basins of intra-arc. Back-arc basins. The Western Mediterranean. Remnant ocean basins. Basins associated with orogens - introduction and obduction. Orogen classification. Types of orogens and petrography. The flexural model. Forebulge. Examples and final notes on relationships.

## **Prerequisites**

No prerequisites

## **Teaching form**

### **Frontal lessons**

PDFs of the course lessons will be uploaded to the e-learning site with the contents and topics covered, accompanied by an appropriate selection of in-depth bibliography.

Student participation in the discussion of the topics covered will be encouraged to facilitate understanding of the topics covered through active and continuous discussion during the course. The course lessons will be made available on a regular basis by sharing PDFs of the presentations.

### **Breakdown in hours/CFU of teaching (DE) and interactive (DI)**

The breakdown in hours/CFU of the teaching of the course will be distributed as follows

a) 28 2-hour lessons in person, with Teaching Instruction (DE) which includes some Teaching steps Interactive (DI) to engage students.

In person lessons for the entire duration of the course.

## **Textbook and teaching resource**

Scientific articles provided by the teacher during the lessons.  
Resources online.

## **Semester**

First semester

## **Assessment method**

There are no ongoing tests planned.

The skills assessed for the final test are those provided during the frontal lessons, of which the ability to analyze a sedimentary basin and its description will be evaluated, together with the ability to connect the topics covered in class.

The evaluation criteria for the final exam include a general assessment of the knowledge acquired during the

course.

The final exam includes: a written test in which an open question will be presented and an oral test in which an interview will take place on the topics covered in class and on the exam texts.

## **Office hours**

Wednesday from 14.30 to 17.30 (to schedule an appointment: [eduardo.garzanti@unimib.it](mailto:eduardo.garzanti@unimib.it))

## **Sustainable Development Goals**

QUALITY EDUCATION

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