UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Geology of Sedimentary Basins

2324-1-F7401Q001

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, mélange 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

Lectures in the classroom.

Textbook and teaching resource

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

Semester

Semester 1.

Assessment method

The skills provided during the frontal lessons will be evaluated in a written exam follow by an oral exam.
The evaluation in general will concern the analysis of a sedimentary basin and its description together with the ability to connect the topics covered in class.

Office hours

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

Sustainable Development Goals

QUALITY EDUCATION