UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

3d Geomodelling

2627-2-F7402Q043

Aims

To reconstruct 3D geological models with advanced software.

Contents

3D geomodelling techniques, discussed in a synthesis on theory, and implemented in exercises and case studies with commercial industry-standard and open-source software.

Detailed program

The course includes a review of theory tightly integrated with practical exercises. Principal topics are: (1) fundamentals of geomodelling, topology, discrete models, grids, geostatistics and interpolation; (2) 3D data sources: surface geology, borehole, and geophysal data (e.g. 2D and 3D seismics); (3) software: problems and functionalities; (4) modelling a simple layer-cake stratigraphy; (5) fault networks; (6) cylindrical folds; (7) complex geo-bodies; (8) representation, modelling and simulation of properties of geological objects; (9) modelling from a 3D seismics dataset.

Prerequisites

Tectonics and structural geology (F7401Q101).

Teaching form

Lessons, laboratory experiences with 3D modelling workstation and software. We will use Move (www.mve.com), Skua/Gocad (www.pdgm.com), and Petrel (www.slb.com) and PZero (https://github.com/gecos-lab/PZero). We acknowledge PE Limited (www.petex.com) for donation of Move licenses worth GBP 1,928,384.01, Schlumberger Italiana Spa (www.slb.com) for donation of Petrel licenses worth USD 8,599,458.24, and finally Emerson Paradigm Holding LLC (www.pdgm.com) and the RING-GOCAD Consortium (www.ring-team.org) for Skua-Gocad.

The course includes 41 hours in person, divided between 7 hours of frontal lectures (delivered didactics) and 36 hours of laboratory activities (interactive teaching). The timetable will be divided into blocks of 3 or 4 hours which will include both lectures and laboratory activities, with the aim of proactively blending theoretical and practical aspects.

Textbook and teaching resource

Slides, scientific papers, references to selected chapters from textbook, presented in a logical order on e-LEARNING.

Semester

First semester.

Assessment method

Reconstruction of a 3D geological model (personal project).

Oral examination regarding all the topics and particularly the project.

Office hours

All days in office hours.

Sustainable Development Goals

QUALITY EDUCATION | AFFORDABLE AND CLEAN ENERGY | INDUSTRY, INNOVATION AND INFRASTRUCTURE