



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### 3d Geomodelling

2021-2-F7401Q029

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#### Aims

To reconstruct 3D geological models with advanced software.

#### Contents

The course regards 3D geomodelling techniques, which are discussed in theory and implemented in exercises with industry-standard 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 geophysical 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) fracture network modelling; (10) retrodeformation; (11) using 3D geomodels as input data for further modelling steps: mechanical models, flow simulators in hydrocarbon geology, hydrogeological models, etc.

#### Prerequisites

Tectonics and structural geology

## **Teaching form**

Lessons, laboratory experiences with 3D modelling workstation and software. We will use Move ([www.mve.com](http://www.mve.com)), Skua/Gocad ([www.pdgm.com](http://www.pdgm.com)), and Petrel ([www.slb.com](http://www.slb.com)). We acknowledge Petroleum Experts Ltd ([www.petex.com](http://www.petex.com)) for donation of Move licenses worth GBP 1,341,961.89, Schlumberger Italiana Spa ([www.slb.com](http://www.slb.com)) for donation of Petrel licenses worth USD 12,519,179.64, and finally Emerson Paradigm Holding LLC ([www.pdgm.com](http://www.pdgm.com)) and the RING-GOCAD Consortium ([www.ring-team.org](http://www.ring-team.org)) for Skua-Gocad. In the Covid-19 emergency period, lectures and practicals will be carried out in mixed form, with both classroom and online activities.

## **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.

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