



**UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA**

## **SYLLABUS DEL CORSO**

### **Geochimica**

2122-2-E3401Q017

---

#### **Aims**

Introducing the basic concepts of inorganic chemistry and applying them to geological processes: magmatism, metamorphism and surface alteration, erosion and transport.

#### **Contents**

Nucleosynthesis, solar system formation, differentiation of the Earth. Element affinities, partition coefficients, formation of the continental crust. Distribution, mobility and behaviour of elements during the main petrogenetic processes (magmatism, metamorphism, surface cycling). Trace elements, discrimination diagrams. Ionic mobility, chemical index of alteration. Physical-chemical factors in sedimentation: diagenesis, clays.

Geochemical characterization of the main terrestrial water reservoirs: oceans, surficial and subsurface continental waters. Thermodynamics of aqueous solutions. Water-rock interaction. Lakes and oceans: biomass, nutrients, geochemical cycles of carbon, nitrogen and phosphorus; reservoirs and fluxes.

Geochemistry of the atmosphere: primordial terrestrial atmosphere, role of CO<sub>2</sub> in the Precambrian, transition to oxidising conditions, present-day atmosphere, climatic cycles and CO<sub>2</sub> concentration.

Instruments for the measurement of major and trace elements.

The course will be giving in Italian.

#### **Detailed program**

Nucleosynthesis, solar system formation, differentiation of the Earth. Element affinities, partition coefficients, formation of the continental crust. Distribution, mobility and behaviour of elements during the main petrogenetic processes (magmatism, metamorphism, surface cycling). Trace elements, discrimination diagrams. Ionic mobility, chemical index of alteration. Physical-chemical factors in sedimentation: diagenesis, clays.

Geochemical characterization of the main terrestrial water reservoirs: oceans, surficial and subsurface continental waters. Thermodynamics of aqueous solutions. Water-rock interaction. Lakes and oceans: biomass, nutrients, geochemical cycles of carbon, nitrogen and phosphorus; reservoirs and fluxes.

Geochemistry of the atmosphere: primordial terrestrial atmosphere, role of CO<sub>2</sub> in the Precambrian, transition to oxidising conditions, present-day atmosphere, climatic cycles and CO<sub>2</sub> concentration.

Instruments for the measurement of major and trace elements.

## **Prerequisites**

Chemistry, physics (suggested)

## **Teaching form**

mixed delivery: lecture and/or live interactive videoconference

## **Textbook and teaching resource**

A. Longinelli, S. Deganello – Introduzione alla Geochimica – UTET

J.I. Drever –The Geochemistry of Natural Waters – Prentice-Hall.

## **Semester**

winter term

## **Assessment method**

Oral examination at the end of the course

## **Office hours**

wednesday 11-13

