



<b>Study Course</b>	<b>GEOLOGICAL SCIENCES</b>
<b>Teaching:</b>	<b>GEOCHEMISTRY</b>
<b>Number of CFU:</b>	<b>6</b>
<b>Semester:</b>	<b>II</b>
<b>Professor:</b>	<b>CICHELLA DOMENICO</b>
<b>PhD students who carry out didactic activities to support the course:</b>	<b>ZUZOLO DANIELA</b>
<b>Reception:</b>	<b>FROM MONDAY TO FRIDAY 13.00-14.00</b>
<b>Address:</b>	<b>Via Port'Arsa, 11 - 82100 Benevento</b>

## **TEACHING PRESENTATION**

The course provides an introduction to the geochemistry through the illustration of its basic principles and the main techniques that are the basis of modern geochemistry. The student will learn to observe Nature by focusing on the many reactions that take place in the various geological environments.

## **THE FORMATIVE OBJECTIVES**

The student acquires a complete knowledge of the geochemistry theoretical bases and its latest applications. He is introduced to the geochemical description of natural systems and educated to a quantitative analysis of natural geochemical processes of anthropic interest.

As a learning result, the student will have a descriptive knowledge of natural geochemical macro-systems and will have developed a good ability in quantitative interpretation of natural inorganic processes.

## **REQUIRED PRACTICES**

We recommend: General and Inorganic Chemistry, Geology, Mineralogy.

## **PARTICIPATION IN LESSONS**

Participation is recommended as it makes easier to study and assimilate the basic concepts of this discipline and allow access to any trials.

## **TEACHING CONTENTS**

Cosmochemistry; the Earth: structure and composition of the Crust, the Mantle and the Core; the rocks; geochemical cycles; environmental geochemistry; isotope geochemistry.

## **DIDACTIC METHODS**

The course is conducted through lectures some held in the laboratory that illustrate the application of the various theoretical aspects of the lessons.

## REFERENCES

- G. Ottonello "Principi di geochimica", Zanichelli, 1991
- A. Longinelli, S. Deganello "Introduzione alla geochimica", UTET, 1999
- De Vivo B., Lima A., Siegel F.R., 2004. Geochimica Ambientale. Liguori Editore, Napoli.
- Appunti del corso preparati dal docente

## EXAM

Written and oral test on topics covered by the program.

## CALENDAR EXAMS

link

## EXAMS RESERVATION

link

## SYLLABUS

Topics	Hours	References	Type of lesson
Abundance of chemical elements in the Universe; Formation and evolution of the Solar System; Cosmic abundance of the chemical elements	2	Course materials prepared by professor G. Ottonello "Principi di geochimica", Zanichelli, 1991 A. Longinelli, S. Deganello "Introduzione alla geochimica", UTET, 1999	Lectures
The chart of nuclides; Origin of the elements; Origin and evolution of the solar system	2	Course materials prepared by professor G. Ottonello "Principi di geochimica", Zanichelli, 1991 A. Longinelli, S. Deganello "Introduzione alla geochimica", UTET, 1999	Lectures
Meteorites: origin, mineralogical and chemical composition	2	Course materials prepared by professor	Lectures
Abundance and distribution of chemical elements in the Earth	2	Course materials prepared by professor	Lectures
Structure and composition of the Crust, Mantle and Core	2	Course materials prepared by professor G. Ottonello "Principi di geochimica", Zanichelli, 1991 A. Longinelli, S. Deganello "Introduzione alla geochimica", UTET, 1999	Lectures
Earth History: heating, chemical differentiation, hydrosphere and atmosphere formation	2	Course materials prepared by professor G. Ottonello "Principi di geochimica", Zanichelli, 1991 A. Longinelli, S. Deganello "Introduzione alla geochimica", UTET, 1999	Lectures
Influence of chemical properties of elements on their geochemical behavior; Geochemical classification of the elements	2	Course materials prepared by professor	Lectures
Igneous, sedimentary and metamorphic rocks	4	Course materials prepared by professor G. Ottonello "Principi di geochimica", Zanichelli, 1991 A. Longinelli, S. Deganello "Introduzione alla geochimica", UTET, 1999	Lectures
Alteration and formation of soils	2	Course materials prepared by professor	Lectures

The Global Water Cycle; Hydrological cycle models and climatic variation scenarios	2	De Vivo B., Lima A., Siegel F.R., 2004. Geochimica Ambientale. Liguori Editore, Napoli. Course materials prepared by professor	Lectures
The global cycle of carbon, nitrogen, phosphorus and sulfur	2	De Vivo B., Lima A., Siegel F.R., 2004. Geochimica Ambientale. Liguori Editore, Napoli. Course materials prepared by professor	Lectures
Cycles: bioaccumulation and impact on living ecosystems	2	De Vivo B., Lima A., Siegel F.R., 2004. Geochimica Ambientale. Liguori Editore, Napoli. Course materials prepared by professor	Lectures
Environmental impacts of pH, redox potential, temperature, BOD, salinity, mineralogy, adsorption phenomena, bioaccumulation	4	De Vivo B., Lima A., Siegel F.R., 2004. Geochimica Ambientale. Liguori Editore, Napoli. Course materials prepared by professor	Lectures + Lesson in the laboratory
Study of heavy metals contaminated ecosystems	4	De Vivo B., Lima A., Siegel F.R., 2004. Geochimica Ambientale. Liguori Editore, Napoli. Course materials prepared by professor	Lectures + Lesson in the laboratory
Source and origin of heavy metals	4	De Vivo B., Lima A., Siegel F.R., 2004. Geochimica Ambientale. Liguori Editore, Napoli. Course materials prepared by professor	Lectures + Lesson in the laboratory
Mobility and immobility of heavy metals in the environment	2	De Vivo B., Lima A., Siegel F.R., 2004. Geochimica Ambientale. Liguori Editore, Napoli. Course materials prepared by professor	Lectures
Potentially toxic metals	2	De Vivo B., Lima A., Siegel F.R., 2004. Geochimica Ambientale. Liguori Editore, Napoli. Course materials prepared by professor	Lectures
Essentiality and risks arising from the presence of potentially toxic metals	2	De Vivo B., Lima A., Siegel F.R., 2004. Geochimica Ambientale. Liguori Editore, Napoli. Course materials prepared by professor	Lectures
Radiogenic elements; Radioactive decay	4	Course materials prepared by professor G. Ottonello "Principi di geochimica", Zanichelli, 1991 A. Longinelli, S. Deganello "Introduzione alla geochimica", UTET, 1999	Lectures + Lesson in the laboratory
Decay systems and their applications	2	Course materials prepared by professor G. Ottonello "Principi di geochimica", Zanichelli, 1991 A. Longinelli, S. Deganello "Introduzione alla geochimica", UTET, 1999	Lectures
Decay series	2	Course materials prepared by professor G. Ottonello "Principi di geochimica", Zanichelli, 1991 A. Longinelli, S. Deganello "Introduzione alla geochimica", UTET, 1999	Lectures
Isotopic fractionation in geological systems	2	Course materials prepared by professor G. Ottonello "Principi di geochimica", Zanichelli, 1991 A. Longinelli, S. Deganello "Introduzione alla geochimica", UTET, 1999	Lectures