



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

TEACHING PRESENTATION

Hydrogeochemistry is primarily a professional course that allows the student to acquire a high level of scientific and professional training. The envisaged activities offer the opportunity to work and learn directly in the classroom, on the ground and in the laboratory. The student learns the main techniques and methods of study of the hydrogeochemistry and environmental geochemistry.

THE FORMATIVE OBJECTIVES

The course aims to provide the theoretical and practical notions on characterization methodologies, site remediation technologies and risk analysis of contaminated sites in land and marine areas.

The student will receive an up-to-date preparation on issues related to the management of contaminated environment, with particular reference to the most advanced monitoring and characterization systems for remediation of soils, contaminated groundwater and sediments.

The main objective is to form scientifically qualified figures able to participate actively in the management of contaminated sites, from planning the characterization project to the definition of the most appropriate remediation strategy.

REQUIRED PRACTICES

We recommend previous knowledge of the most common statistical softwares and GIS.

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

Water properties. Solubility and hydrolysis of the main minerals. Factors that influence the behavior of chemical elements in the various environmental media. Italian, international and WHO guidelines. Natural and anthropogenic pollution. Hydrogeochemistry in resolution of environmental problems. Sampling methods. Data processing. Characterization of contaminated sites. Remediation.

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

Course materials prepared by professor.

EXAM

Written and oral test on topics covered by the program.

CALENDAR EXAMS

link

EXAMS RESERVATION

link

SYLLABUS

Topics	Hours	References	Type of lesson
Water properties	2	Course materials prepared by professor	Lectures
Solubility and hydrolysis of the main minerals	2	Course materials prepared by professor	Lectures
Factors that influence the behavior of chemical elements in water and soil: ionic potential, pH, oxidation potential, adsorption, bacterial activity, etc.	2	Course materials prepared by professor	Lectures
pH-Eh Diagrams Chemical composition of marine and continental waters. Graphical representation of the water chemical composition	2	Course materials prepared by professor	Lectures
Water Quality Parameters. Italian, international and WHO guidelines. Water intended for human consumption: mineral waters and tap water	2	Course materials prepared by professor	Lectures
Natural and anthropogenic pollution	2	Course materials prepared by professor	Lectures
Site Characterization. D.L. 152/2006. Characterization plan.	4	Course materials prepared by professor	Lectures
Sampling methods. Sample analysis and protocols. Quality controls (accuracy and precision)	4	Course materials prepared by professor	Lectures + laboratory
Statistical analysis of geochemical data	6	Course materials prepared by professor	Lectures + laboratory
Determination of background and anomalous values	4	Course materials prepared by professor	Lectures + laboratory
Data Processing	6	Course materials prepared by professor	Lectures + laboratory

Geochemical mapping using geographic information systems (GIS)	6	Course materials prepared by professor	Lectures + laboratory
Risk analysis in contaminated sites	6	Course materials prepared by professor	Lectures + laboratory
Remediation of contaminated sites	6	Course materials prepared by professor	Lectures + laboratory