LOGO DELLA STRUTTURA PRIMARIA

COURSE: SOIL CHEMISTRY			
ACADEMIC YEAR: "2016/2017			
TYPE OF EDUCATIONAL ACTIVITY: Characterizing			
TEACHER: Sabino Aurelio Bufo			
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phone: 0971 205232		mobile (optional): 3293606251	
Language: English			
ECTS: 6 (lessons 4, tutorials/practice 2)	n. of hours: 56 (lessons 32, tutorials/practice 24)	Campus: Potenza Dept./Sciences CdS:Geosciences-and - Georisources **(LM74)**	Semester: **I** (from 03/10/2016, to 15-31/01/2017)

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

This course gives a contribution to the knowledge of environmental sustainability, with a particular emphasis to the use and preservation of soil.

Students shall consider the soil as a primary asset that can be used for human activities without modification of its properties, quality, and value.

At the end of this course students should have acquired mastery of chemical and physical-chemical techniques for the soil quality assessment.

The course aims to provide students with the knowledge related to the genesis, composition, classification of the soil, as well as its chemical properties, physical and chemical - physical, especially with regard to the exchange reactions and pH.

Some of the processes of transformation and degradation of the soil are also handled. Aspects related to fluid phases contained in soil and their property are also provided.

Some exercises on sampling and laboratory analysis complete the educational process of this course.

PRE-REQUIREMENTS

Good knowledge of basic chemistry.

SYLLABUS

The inorganic solid phases

The lithology of soil

The crystalline and amorphous minerals

- Silicates, phyllosilicates, oxides, hydroxides
- other minerals of interest in soil

The organic phases of the soil

The organic matter

- organic constituents
- humification
- energy and environmental meaning
- extraction and fractionation
- chemical and chemical –physical properties

The phenomena of adsorption and exchange

Charges on the soil surfaces

- permanent charges
- pH dependent or variable charges

Retention and cation exchange

- the electrical double layer
- qualitative aspects of the exchange (reversibility, stoichiometry, velocity, mass action , etc.).
- selectivity of the exchange

Retention of anionic and molecular compounds

- exchangeable anions

- adsorption of neutral or partially charged molecules

Equations of the exchange and adsorption isotherms.

Kinetics of soil release. Evaluation of the kinetic parameters.

pH and redox potential

The pH of the soil and its regulation

- acceptors and electron donors ;
- the redox in soil

TEACHING METHODS

Theoretical lessons, Classroom tutorials, Laboratory tutorials.

EVALUATION METHODS

Practical test, Oral examination, Written report.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

Nyle C. Brady: The Nature and Properties of Soils, Prentice Hall

George Stoops, author; M.J. Vepraskas, ed.Guidelines for Analysis and Description of Soil and Regolith Thin Sections. SSSA

INTERACTION WITH STUDENTS

Riportare in lingua inglese i contenuti riportati nella scheda in lingua in italiana.

EXAMINATION SESSIONS (FORECAST)[1]

February, July, September 2017. Exact dates can be agreed for each month

SEMINARS BY EXTERNAL EXPERTS YES □ NO X

FURTHER INFORMATION

Student should attend the lectures given during this course to be permitted to access to laboratory exercises. Students will report on the results obtained in the tests laboratory practices

[1] Subject to possible changes: check the web site of the Teacher or the Department/School for updates.