
ACADEMIC YEAR: 2016/2017

COURSE: Agricultural chemistry and principles of forestry biochemistry

TYPE OF EDUCATIONAL ACTIVITY: Basic

TEACHER: Prof. Antonio Scopa

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web:

phone: +39 (0) 971 445975

mobile (optional): +39 329 3606253

Language: Italian

ECTS: (8 of lessons and 1
of laboratory/practice)

n. of hours: (64 of lessons
and 16 of labs/practice)

Campus: Potenza
School: SAFE
Program:

Semester: II

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The goal in this teaching is to enable students to acquire the basic knowledge and operational capabilities for understanding the main chemical and physical processes that are the basis of soil formation and chemical and biological soil fertility in addition to those the complex soil-plant-atmosphere system.

The result to be achieved will be the one to introduce the students the tools to make him understand the role that the soil plays in the sustainability of agricultural, forestry and natural environments. The course also aims to introduce the student to the understanding and use of the main soil classification.

PRE-REQUIREMENTS

Students wishing to access this teaching is advised to have a good grounding in the foundations of mathematics, physics, general and organic chemistry as well as elements of plant biology.

SYLLABUS

Course presentation Pedogenesis environment. Structure and properties of silicates. Silicate hydrolysis. Pedogenesis factors. Soil colloidal properties. Structure and properties of Al and Fe Hydroxyoxides, micas, smectites, vermiculites and kaolins. Elements of pedology and soil classification

Humus: extraction, fractionation, composition and physico-chemical properties. Forest soils. Forest humus. Soil Adsorbing capacity.

Mechanical, biological and chemical absorption. Adsorption exchange (anionic and cationic). Soil pH and buffer power. Diagram pE-pH.

Nutrient cycles in soil-plant system. introduction to soil pollution.

Step light of photosynthesis: the formation of ATP. Dark phase of photosynthesis: C3 and C4 cycles. Photosynthetic efficiency. Enzymes: classification, characteristics, composition, co-enzymes, cofactors, prosthetic groups. Enzyme kinetics and mechanisms of inhibition.

Amino-acids and proteins. Lipids. Nitrogen cycle: nitrogen-fixing, and into organic nitrogen mineralization, biosynthesis of glutamine.

Laboratory experiments for the determination of soil characteristics.

TEACHING METHODS

Theoretical lessons, Laboratory tutorials. The topics of the course will be treated with the help of Power Point presentations both for lectures and for the laboratory exercises.

EVALUATION METHODS

Oral examination.

Verifying the learning of teaching is to find the level of achievement of the previously mentioned educational goals and is through an oral examination. the evaluation is addressed on the arguments developed in the lectures and will

be placed six basic questions, two for each thematic area (soil chemistry, agricultural biochemistry and pedology). It will proceed to the appropriate inquiries on the topics. The verification must be overcome in a comprehensive manner. It is necessary that the candidate reaches a sufficient assessment in each of the three subject areas that characterize this course. The scores achieved in each of the areas of training and making a weighted average of the scores, according to the credits devoted to each area (6 CFU Soil Chemistry, 2 for Biochemistry and 1 CFU for pedology) will be assessed. The duration of the oral exam is assessed in about 40 minutes.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

AA.VV., 2003. Biochimica agraria, Scarponi L. Coord., Pàtron Editore, Bologna.

AA.VV., 2005. Fondamenti di Chimica del Suolo, Sequi P. coord., Pàtron Editore, Bologna.

Mengel K. e Kirkby E.A., 2001. Principles of Plant Nutrition. 5th Edition. Pp. 849. Kluwer Academic Publishers, Dordrecht, Boston, London.

Lesson notes.

In relation to the contents of the course will be specified the parts to be explored.

INTERACTION WITH STUDENTS

At the beginning of the course, after describing the objectives, program and methods of verification, the teacher collects the list of students accompanied by name and email.

The teacher receives from Monday to Friday from 9.00 to 11.00 and he is available at all times for a contact with the students, through its e-mail or telephone.

EXAMINATION SESSIONS (FORECAST)

18/07/2016, 14/09/2016, 11/10/2016, 15/11/2016, 14/12/2016

EVALUATION BOARD

Prof. Antonio SCOPA

Prof. Adriano SOFO

Prof. Sabino Aurelio BUFO

Prof. Piergiorgio GHERBIN

Dott. Maria NUZZACI

Dott. Laura SCRANO

SEMINARS BY EXTERNAL EXPERTS YES NO

FURTHER INFORMATION
