

COURSE: **Chemistry of fertilizers and pesticides (AGR0039)**

ACADEMIC YEAR: 2016/2017

TYPE OF EDUCATIONAL ACTIVITY:

TEACHER: Prof. ANTONIO SCOPA

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Language: Italian

ECTS: (7 of lessons and 1 of laboratory/practice)	n. of hours: (56 of lessons and 16 of labs/practice)	Campus: Potenza School: SAFE Program: Bachelor in Agricultural Science and technology	Semester: I
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EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course aims to provide students with theoretical and practical knowledge on chemical and biological aspects of the soil-plant system. The aim is to provide knowledge about the regulations and the use of fertilizers and on the use and recycling of agro-forestry biomass. In addition, it aims to provide the knowledge on use classification, and about the main biotic and abiotic transformation processes of xenobiotic molecules in the interface soil-plant-atmosphere. Students can work independently on particular topics and to make a contribute, in terms of communication to the other students.. Theoretical part is followed by laboratory tests and numerical exercises.

PRE-REQUIREMENTS

To understand the material presented in this course are needed thorough knowledges of General Chemistry, Organic Chemistry, Agricultural Chemistry, Microbiology and Plant Physiology.

SYLLABUS

1st credit: Elements of plant nutrition: chemical forms and redox states. Biochemical cycle and bio-availability for the plants of: macro elements (N, P, K), meso elements (Ca, Mg and S) and micro-elements (B, Cu, Fe, Mn, Mo , Zn)

2nd credit: Availability and uptake of nutrients: plant-root kinetic environment, kinetics of nutrient release, maximum amount available

3rd credit: Fertilization. Organic matter and soil microbial biomass: evolution of organic matter, contributions and consumption. Recycling of organic waste products: sources, stabilization treatments, use. Fertilizers: types, chemical characteristics, behavior in soil. Italian and EU regulations

4th credit: Properties and classification of crop protection products: chemical classification, modes of action, formulations, methods of treatment

5th credit: Transformation and degradation of xenobiotic molecules adsorption and desorption in soil, transformation and degradation of biotic and abiotic, environmental distribution, environmental remediation processes

6th credit: Toxicity of xenobiotics: translocation of agrochemicals in plant and mechanisms of action, the main functional pathways and cellular metabolism

7th credit: Toxicity of xenobiotics: translocation of agricultural chemicals in living organisms, main effects, functional pathways and cellular metabolism

8th credit: Sampling Methods of water and fertilizers. Instrumental analytical methods for the determination of the chemical-physical characteristics of fertilizers and water. Determinations of phosphorus and nitrogen. Kinetics of nutrient release. Determination of pesticide residues and / or metabolites.

TEACHING METHODS

Theoretical lessons, Laboratory and numerical 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 to verify the learning of teaching. The objective is to find the level of achievement of the previously

mentioned educational goals and discussed in the lectures. To the student will be placed four basic questions and the duration of the oral exam is assessed in about 40 minutes.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

Skoog Douglas A. – West Donald M., Chimica analitica. Una introduzione, Edises Napoli

AAVV – Norme per la disciplina dei fertilizzanti, Arvan Ed. Venezia

Muccinelli – Prontuario degli Agrofarmaci

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)

20/1/2017, 24/2/2017, 24/3/2017, 20/7/2017, 21/9/2017, 19/10/2017, 23/11/2017, 21/12/2017, 18/1/2018, 22/3/2018

EVALUATION BOARD

Prof. Antonio SCOPA

Prof. Adriano SOFO

Prof. Sabino Aurelio BUFO

Prof. Piergiorgio GHERBIN

Dr.ssa Laura SCRANO

Dr.ssa Maria NUZZACI

SEMINARS BY EXTERNAL EXPERTS YES

FURTHER INFORMATION
