UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Agrarie, Alimentari e Forestali
ACADEMIC YEAR	2018/2019
BACHELOR'S DEGREE (BSC)	FORESTRY AND ENVIRONMENTAL SCIENCES
SUBJECT	FOREST SOIL CHEMISTRY
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50125-Discipline della produzione vegetale
CODE	18684
SCIENTIFIC SECTOR(S)	AGR/13
HEAD PROFESSOR(S)	CONTE PELLEGRINO Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	8
INDIVIDUAL STUDY (Hrs)	132
COURSE ACTIVITY (Hrs)	68
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	2
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**CONTE PELLEGRINO** Wednesday 10:00 12:00 Dipartimento di Scienze Agrarie, Alimentari e Forestali, v.le delle Scienze ed. 4 - primo piano stanza n. 140. Durante il semestre in cui il Prof. Conte e' impegnato con l'attivita' didattica, il ricevimento va concordato via e-mail

DOCENTE: Prof. PELLEGRINO CONTE

PREREQUISITES	Students need a basic knowledge on general chemistry, organic chemistry, mathematics and physics
LEARNING OUTCOMES	Knowledge: Students must acquire knowledge and criticism about the questions related to forest soil transformations. Comprehension of: Students must be independent in the evaluation of all the problems concerning all the subjects related to soil science regardless of the fact that those have been exhaustively reported during the course. Ability to: Students must be able to understand written documents in both Italian and English. They must develop communicative skills by applying the rules of the scientific method
ASSESSMENT METHODS	An oral exam will be applied in order to evaluate students' knowledge. The final vote is included in the range 18-30/30 (cum laude). The lowest vote (18/30) is for students which will show only the accomplishment of the minimum knowledge. The highest vote (30/30 cum laude) is for the students showing a deep knowledge of the discipline with the evaluation of problems not evaluated during the lessons, but related with the topics included in the course program
EDUCATIONAL OBJECTIVES	The course will provide basic knowledge about soil chemistry and the role of soil as environmental ecosystem. Starting from the ideal soil models, the course will focus on the chemistry of real systems such as real solutions and real solid phase matters. The interactions between the different soil phases will be emphasised together with the dynamics of soil components exchanging among the different phases. Last part of the course will account for the role of anthropic activities on soil degradation. A general overview about soil remediation will be also provided
TEACHING METHODS	The course will proceed with lessons and exercises in both lab and classroom
SUGGESTED BIBLIOGRAPHY	Appunti dalle lezioni P. Sequi, C. Ciavatta, T. Miano (a cura di), Fondamenti di chimica del suolo, Patron editore, Bologna K.H. Tan, Principles of Soil Chemistry CRC press P. Violante, Chimica e fertilita' del suolo, edagricole Radaelli

SYLLABUS

Hrs	Frontal teaching
10	Introduction. Meaning of soil. Gas phase in soils: the laws describing the behaviour of air in soils; solubility of gases in water in soils
23	Water structure and its properties; dissolution mechanisms; non-ideal solutions; activity and activity coefficient; Ionic strength; Debye-Hueckel laws for nutrient dynamics; electrolytes; solubility diagrams and their interpretation; Redox reactions in soils as related to nutrient availability and soil erosion; Soil colloids: soil organic matter and soil clay minerals
15	soil physical properties; water potential; adsorption mechanisms and ionic exchanges; qualitative and quantitative aspects of soil adsorption properties

Hrs	Practice
10	Lab exercises for the evaluation of the chemical physical soil properties

Hrs	Workshops
10	Study and uses of the main instruments to be used in soil science field