UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Agrarie, Alimentari e Forestali		
ACADEMIC YEAR	2024/2025		
MASTER'S DEGREE (MSC)	AGROENGINEERING AND FORESTRY SCIENCES AND TECHNOLOGIES		
INTEGRATED COURSE	SOILS AND QUALITY INDICATORS		
CODE	21789		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	AGR/14, AGR/13		
HEAD PROFESSOR(S)	LAUDICINA VITO ARMANDO	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	LAUDICINA VITO ARMANDO	Professore Ordinario	Univ. di PALERMO
	LO PAPA GIUSEPPE	Professore Associato	Univ. di PALERMO
CREDITS	6		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	**LAUDICINA VITO ARMANDO** Wednesday 11:00 14:00 Dip. SAAF, 1° piano, studio 142 **LO PAPA GIUSEPPE** Monday 10:00 13:00 Ufficio Docente: Dipartimento di Scienze Agrarie, Alimentari e Forestali (SAAF), Viale delle Scienze Ed. 4, ingresso L, piano 2°, Stanza 211. Friday 10:00 13:00 Ufficio Docente: Dipartimento di Scienze Agrarie, Alimentari e Forestali (SAAF), Viale delle Scienze Ed. 4, ingresso L, piano 2°, Stanza 211.		

DOCENTE: Prof. VITO ARMANDO LAUDICINA

PREREQUISITES	basic knowledge of general chemistry, organic chemistry, soil chemistry
LEARNING OUTCOMES	Knowledge and understanding: the student will be able to understand the importance of soil indicators as a key tool for assessing the quality or degree of deterioration. Ability to apply knowledge and understanding: the student will be able to choose the most appropriate indicators for assessing soil quality and for their sustainable management. Independent judgment: the student using the results of the physical, chemical and biochemical analyzes of the soil will be able to evaluate their most suitable use. Furthermore, you will be able to predict the effects of land use on its quality. Communication skills: the student will be able to describe the quality of the soil and indicate, case by case, the indicators to be used. Learning skills: the student will be able to deepen the relationships between the different properties of the soil used for the assessment of its quality through the consultation of soil science scientific texts and journals.
ASSESSMENT METHODS	The learning assessment will be verified by an oral exam. The votes will be in the range 18-30 cum laude. The minimum score is 18, the maximum score is 30 cum laude. The way how the final evaluation will be formulated depends on the knowledge of the topics, on the deduction ability, on the information processing, as well as on the capacity to apply the knowledge interdisciplinarly. The vote will be between a) 18-21 when the above knowledge and skills are sufficient; b) 22-25 when the aforementioned knowledge and skills will be fair; c) 26-29 theabove knowledge and skills will be from good to excellent; d) 30-30 with honors when the above knowledge and skills are excellent. Compensatory tools and dispensatory measures will be guaranteed by the Disability and Neurodiversity Center - University of Palermo (Ce.N.Dis.) to students with disabilities and neurodiversity, based on specific needs and in implementation of current legislation.
TEACHING METHODS	classroom lessons and laboratory activity

MODULE
AGRICULTURAL PEDOLOGY

Prof. GIUSEPPE LO PAPA

SUGGESTED BIBLIOGRAPHY	
Dazzi C. (2021) – Fondamenti di Pedologia. Le Penseur. ISBN : 978-88-95315-20-1	
AMBIT	21013-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	43
COURSE ACTIVITY (Hrs)	32
EDUCATIONAL OBJECTIVES OF THE MODULE	
The teaching of Agricultural Pedology deals with the genesis, evolution and classification of soils and their organization into complex structural units. The course allows students to known the basic elements to acquire the ability' to read analytically and in a relationship of cause/ effect, factors and processes of pedogenesis, as well as the basic knowledge of the methodologies of study and classification of the soil resource for its correct management.	

SYLLABUS

Hrs	Frontal teaching
2	Soil concept and pedogenesis
2	The soil profile
3	Inorganic and organic soil constituents
3	Le proprietà del suolo
4	Soil formation processes
2	Soil classificationl
2	Soil Taxonomy: the USDA System
2	WRB classification system

Hrs	Workshops
4	Exercises of soil classification using the Soil Taxonomy
4	Exercises of soil classification using the WRB
4	Laboratory analysis on soil physical and chemical properties

MODULE
SOIL QUALITY INDICATORS

Prof. VITO ARMANDO LAUDICINA

SUGGESTED BIBLIOGRAPHY

Appunti del Docente distribuiti durante il corso
MiPAF, 2004. Metodi di analisi biochimica del suolo. Ed. Franco Angeli
Weil R.R., Brady N.C., The nature and properties of soils. Pearson editore
Violante P., Chimica e fertilità del suolo, Edagricole, 2013.

AMBIT	21013-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	43
COURSE ACTIVITY (Hrs)	32

EDUCATIONAL OBJECTIVES OF THE MODULE

To provide students with the concept of soil as a living system, dynamic entity and central node of biogeochemical cycles and environmental balances. The concept of soil quality is presented not as a mere supply of nutritional elements linked to the productive and agronomic aspects, but as an integration of the physical, chemical and biological factors that contribute to the maintenance and conservation of the soil resource. In addition, provide students with the tools to assess the quality of the soil, or its degree of deterioration.

SYLLABUS

Hrs	Frontal teaching
2	Soil quality definition. The concepts of indicator and index. Main indicators and indices of soil quality
2	Recalls: The non-living organic substance of the soil as an indicator of soil quality. Relations between organic matter and soil properties
2	Soil microbial biomass: measure, significance and variation factors
4	Soil microbial activity: measurement, significance and variation factors
2	Soil respiration: basal, induced, respiration rate, meanings and variation factors
6	Simple indicators of soil quality: the microbial carbon / organic carbon ratio; the metabolic quotient and mineralizing power of the soil - meaning and variation factors.
2	Soil enzymes. The hydrolytic activity of the soil in the carbon, nitrogen, phosphorus and sulfur cycle. The redox activity of the soil. Catalytic activities as soil quality indicators.

Hrs	Workshops
12	Main methods of soil biochemical analysis: carbon and nitrogen of microbial biomass, soil respiration, soil enzymes, structure of the soil microbial community