



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Scienze Agrarie, Alimentari e Forestali		
<b>ACADEMIC YEAR</b>	2024/2025		
<b>MASTER'S DEGREE (MSC)</b>	AGROENGINEERING AND FORESTRY SCIENCES AND TECHNOLOGIES		
<b>INTEGRATED COURSE</b>	SOILS AND QUALITY INDICATORS		
<b>CODE</b>	21789		
<b>MODULES</b>	Yes		
<b>NUMBER OF MODULES</b>	2		
<b>SCIENTIFIC SECTOR(S)</b>	AGR/14, AGR/13		
<b>HEAD PROFESSOR(S)</b>	LAUDICINA VITO ARMANDO	Professore Ordinario	Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	LAUDICINA VITO ARMANDO	Professore Ordinario	Univ. di PALERMO
	LO PAPA GIUSEPPE	Professore Associato	Univ. di PALERMO
<b>CREDITS</b>	6		
<b>PROPAEDEUTICAL SUBJECTS</b>			
<b>MUTUALIZATION</b>			
<b>YEAR</b>	1		
<b>TERM (SEMESTER)</b>	1° semester		
<b>ATTENDANCE</b>	Not mandatory		
<b>EVALUATION</b>	Out of 30		
<b>TEACHER OFFICE HOURS</b>	<p><b>LAUDICINA VITO ARMANDO</b> Wednesday 11:00 14:00 Dip. SAAF, 1° piano, studio 142</p> <p><b>LO PAPA GIUSEPPE</b> Tuesday 10:00 13:00 Ufficio Docente: Dipartimento di Scienze Agrarie, Alimentari e Forestali (SAAF), Viale delle Scienze Ed. 4, ingresso L, piano 2°, Stanza 218.</p> <p>Wednesday 10:00 13:00 Ufficio Docente: Dipartimento di Scienze Agrarie, Alimentari e Forestali (SAAF), Viale delle Scienze Ed. 4, ingresso L, piano 2°, Stanza 218.</p>		

DOCENTE: Prof. VITO ARMANDO LAUDICINA

<b>PREREQUISITES</b>	basic knowledge of general chemistry, organic chemistry, soil chemistry
<b>LEARNING OUTCOMES</b>	<p>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.</p> <p>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.</p> <p>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.</p> <p>Communication skills: the student will be able to describe the quality of the soil and indicate, case by case, the indicators to be used.</p> <p>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.</p>
<b>ASSESSMENT METHODS</b>	<p>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 interdisciplinarily. 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 the above knowledge and skills will be from good to excellent; d) 30-30 with honors when the above knowledge and skills are excellent.</p> <p>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.</p>
<b>TEACHING METHODS</b>	classroom lessons and laboratory activity

**MODULE  
AGRICULTURAL PEDOLOGY**

*Prof. GIUSEPPE LO PAPA*

**SUGGESTED BIBLIOGRAPHY**

Dazzi C. (2021) – Fondamenti di Pedologia. Le Pensur. ISBN : 978-88-95315-20-1

<b>AMBIT</b>	21013-Attività formative affini o integrative
<b>INDIVIDUAL STUDY (Hrs)</b>	43
<b>COURSE ACTIVITY (Hrs)</b>	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 know 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**

<b>Hrs</b>	<b>Frontal teaching</b>
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 classificationI
2	Soil Taxonomy: the USDA System
2	WRB classification system
<b>Hrs</b>	<b>Workshops</b>
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.

<b>AMBIT</b>	21013-Attività formative affini o integrative
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<b>COURSE ACTIVITY (Hrs)</b>	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