

DISCIPLINE DESCRIPTION

1. Information on the study programme

1.1 Academic institution	UNIVERSITY OF ORADEA
1.2 Faculty	FACULTY OF ENVIRONMENTAL PROTECTION
1.3 Department	ENVIRONMENTAL ENGINEERING
1.4 Field of study	ENVIRONMENTAL ENGINEERING
1.5 Cycle of study	BACHELOR
1.6 Study programme/Qualification	ENGINEERING OF BIOTECHNICAL AND ECOLOGICAL SYSTEMS / ENGINEER

2. Information on the discipline

2.1 Name of discipline		Soil Science I					
2.2 Course holder		Prof. univ. dr. ing. SABĂU NICU CORNEL					
2.3 Seminar/Laboratory/Project holder		Lecturer dr. ing. VENIG-UNGUR ADELINA					
2.4 Year of study	II	2.5 Semester	IV	2.6 Type of evaluation	Ex	2.7 Regime of discipline	C

(C) Compulsory; (O) Optional; (E) Elective

3. Total estimate time (hours per semester of didactic activities)

3.1 Number of hours per week	4	out of which: 3.2 course	2	out of which 3.3 seminar/laboratory/project	2
3.4 Total hours in the curriculum	56	out of which: 3.5 course	28	out of which 3.6 seminar/laboratory/project	28
Time allotment					hours
Study assisted by manual, course support, bibliography and notes					7
Additional documentation in the library/ on specialised electronic platforms and in the field					3
Preparation of seminars/laboratories/ topics/reports, portfolios and essays					5
Tutorship					2
Examinations					2
Other activities.....					-
3.7 Total hours of individual study	10				
3.9 Total hours per semester	75				
3.10 Number of credits	3				

4. Prerequisites (where appropriate)

4.1 curriculum	-
4.2 competences	General knowledge about soil science

5. Conditions (where appropriate)

5.1. related to course	PC, video projector
5.2. related to seminar/laboratory/ project	The specific equipment needed to carry out the practical work

6. Specific competences acquired	
Professional competences	<ul style="list-style-type: none"> ▪ C1.1. Defining the fundamental concepts necessary for the application of environmental scientific theories and methodology. ▪ C1.5. Identification of scientific solutions for the implementation of professional and technological projects. ▪ C2.4. Qualitative and quantitative evaluation of natural phenomena and human activities on the quality of environmental factors
Transversal competences	<ul style="list-style-type: none"> ▪ CT1. Identifying and respecting the norms of professional ethics and deontology, assuming responsibility for the decisions made and related risks ▪ CT2. Identifying roles and responsibilities in a multidisciplinary team and applying communication techniques and effective work within the team

7. Objectives of discipline (coming from the specific competences acquired)

7.1 General objective	<ul style="list-style-type: none"> ▪ The discipline is part of the category of field disciplines, with the objective of familiarizing students with the specific notions of soil science, the way soils are formed under the conditions of our country, the main classes and types of soils in our country
7.2 Specific objectives	<p>Competencies regarding pedogenesis, soil properties and their taxonomy.</p> <ul style="list-style-type: none"> ▪ Theoretical knowledge – Knowledge, understanding and easy use of basic concepts and methods specific to the field of soil science. ▪ Acquired skills – Effective use of the basic knowledge acquired in the course, for the correct explanation and interpretation of concepts and processes related to pedogenesis. ▪ Acquired skills – The ability to apply and use the knowledge acquired throughout the year, to solve problems related to soil properties and their taxonomy. ▪ Attitudinal - The ability to work in a team, responsible execution of work tasks.

8. Content*/

8.1 Course	Methods of teaching	No. of
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		hours/Remarks
THE ENVIRONMENT, POLLUTION AND THE SOIL Pedology - The soil science; Brief history about the development of pedology; Soil functions;	Interactive Lecture	2
NOTIONS OF GEOLOGY - Lithosphere. Plate tectonics; The magmatic rocks; The formation of minerals and magmatic rocks; Characteristics of magmatic rocks; The metamorphic rocks; Characteristics of metamorphic rocks; The sedimentary rocks; The formation of minerals and sedimentary rocks; Characteristics of sedimentary rocks.	Interactive Lecture	4
SOIL FORMATION - General aspects of soil genesis; Rock role in pedogenesis; Climate role in soil formation; Relief role in soil formation; The role of stagnant and groundwater in soil formation; The role of the flora and fauna in soil formation; The role of the time on soil formation; Human role in soil formation.	Interactive Lecture	2
THE MINERAL SOLID PHASE OF SOILS - The chemical composition of the earth's crust; The mineralogical composition of the earth's crust; The formation of the mineral part of the soil; The disaggregation; The alteration; The products of disaggregation and alteration.	Interactive Lecture	2
THE ORGANIC SOLID PHASE OF SOILS - The origin and chemical composition of soil organic residues; Decomposition of soil organic residues; The humification; The composition and properties of humic acids; The types of humus from the soil; The humus and soil fertility.	Interactive Lecture	2
SOIL MORPHOLOGY -The morphological characteristics of the soil profile; The soil color; The soil special formations; Pedogenetical processes; The pedogenetical horizons; Properties and parent materials diagnoses.	Interactive Lecture	4
THE BIOLOGICAL SOIL PROPERTIES - The soil as habitat and biological product; The soil organisms; The transformations of organic matter; The biological activity of the soil; Importance of biological soil properties.	Interactive Lecture	2
THE CHEMICAL PROPERTIES OF SOIL - Soil solution and its properties; Soil colloids and their main properties; The adsorption capacity of the soil; The soil reaction; The role of the reaction and of the buffering capacity; The soil oxidation-reduction potential.	Interactive Lecture	2
THE PHYSICAL PROPERTIES OF SOIL - Soil texture; Soil structure; Soil particle density; Soil porosity; Soil compaction.	Interactive Lecture	2
THE HYDROPHYSICAL PROPERTIES OF SOIL - The forces acting on the water from soil; The energetic potential of the water from soil; The hydrophysics indices of soil; The soil permeability; The miscible displacement; The water balance from soil; The water regime of the soil.	Interactive Lecture	1
THE AIR AND TEMPERATURE OF SOIL - The aeration of the soil; The air content of the soil; The composition of soil air; The air permeability of the soil; The air regime from the soil; The role of air from the soil; The soil temperature; The sources and losses of caloric energy; The thermal properties of the soil; The thermal conductivity of the soil; The thermal regime of the	Interactive Lecture	4

soil; The importance of soil thermal regime		
Bibliography		
1. Sabău N.C., Geneza Degradarea și Poluarea Solului, Partea I., Știința Solului – Geneza și Proprietățile solului, Ediția a II-a, Editura Universității din Oradea, ISBN general 978-606-10-1767-6, ISBN volum 978-606-10-1768-3, pg.254, 2016;		
2. Blaga Gh., Rusui., Urdescu S., Vasiled: - 1996- Pedologie - Ed. Didactică și Pedagogică București;		
3. Cojocar I., - 1995 – Surse, procese și produse de poluare. – Ed Junimea, Iași;		
4. Oanea N., Rogobete Gh.,- 1977 - Pedologie generală și ameliorativă. Ed. Didactică și Pedagogică București;		
5. Rogobete Gh. – Știința Solului, Bazele științei solului. Ed. Mirton, Timișoara;		
6. Sabău N.C. – 1997- Impactul Lucrărilor Hidroameliorative asupra Solurilor din Perimetrul Valea Ier. – Ed. Universități din Oradea;		
7. Sabău N.C. Domuța C. Berchez O. – 1999 – Geneza degradarea și poluarea solului. – Ed. Universități din Oradea.		
8. Sabău N.C. – 2008 – Poluarea Mediului Pedosferic, Ed. Univ. din Oradea,		
9. Teaci D. – 1980- Bonitatea terenurilor agricole. Ed. Ceres București;		
8.2 Seminar	Methods of teaching	No. of hours/ Remarks
Bibliography		
8.3 Laboratory		
Laborprotectionandthepresentation of thePedologyandSoilPollutionLaboratory.	Explanations, exemplification, dialogue, case study, video	2
Elements of Geology. Introductory notions. Definition and object of Geology. Subdivisions of Geology. Lithosphere.	Explanations, exemplification, dialogue, case study	2
The mineralogical composition of the earth's crust. Properties of minerals.	Explanations, exemplification, dialogue, case study	2
Morphological, optical, mechanical, magnetic, physical and chemical properties.	Explanations, exemplification, dialogue, translations	2
Genesis and classification of minerals. Native element class.	Explanations, exemplification, dialogue, case study	2
Class of haloid salts.	Explanations, exemplification, dialogue, case study	2
Sulphideclass.	Explanations, exemplification, dialogue, case study, video	2
Class of oxidesandhydroxides	Explanations, exemplification, dialogue, case study, video	2
Class of oxygenatedsalts.	Explanations, exemplification, dialogue, case study, video	2
The class of organic compounds.	Explanations, exemplification, dialogue, case study, video	2
The petrographic composition of the earth's crust. General	Explanations,	2

aspects.	exemplification, dialogue, case study, video	
Magmatic rocks. Recognition. Classification. Description of the main magmatic rocks.	Explanations, exemplification, dialogue, case study, video	2
Sedimentary rocks. Recognition. Classification. Description of the main sedimentary rocks.	Explanations, exemplification, dialogue, case study, video	2
Metamorphic rocks. Recognition. Classification. Description of the main metamorphic rocks.	Explanations, exemplification, dialogue, case study, video	2
8.4 Project		
Bibliography <ol style="list-style-type: none"> 1. Sabău N.C. – <i>Metode pentru analiza solului- Pentru uzul studenților- 2012, Editura Universității din Oradea, pp. 338, ISBN 978-606-10-0946-6,;</i> 2. Blaga Gh., Bunescu V. – 1999 – <i>Lucrări practice la pedologie, Tipografia Agronomia, Cluj-Napoca;</i> 3. Brejea R., Domuța C. – 2011 – <i>Practicum de Pedologie, Editura Universității din Oradea;</i> 4. Canarache A., Șerbănescu I., Teaci D., Savapol L. – 1967 – <i>Îndrumător pentru studiul solului pe teren și în laborator, Ed. Agrosilvică, București;</i> 5. Domuța, C. și colab., 2011, <i>Practicum de monitoring al mediului, Edit. Univ. din Oradea;</i> Târziu D., Spârchez Gh., Dincă L. – 2004 – <i>Pedologie cu elemente de Geologie, Editura Silvodel, Brașov;</i>		

* The content, respectively the number of hours allocated to each course / seminar / laboratory / project will be detailed during the 14 weeks of each semester of the academic year.

9. Corroboration of discipline content with the expectations of the epistemic community, professional associations and representative employers from the field corresponding to the study programme

<ul style="list-style-type: none"> By learning the theoretical concepts and dealing with the practical aspects included in the discipline, students acquire a consistent body of knowledge, in accordance with the skills required for the occupations provided in the RNCIS Grid
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10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the final grade
10.4 Course	Exam	Oral	67 %
10.5 Seminar			
10.6 Laboratory	Periodic check	Grid test	33 %
10.7 Project			
10.8 Minimum standard of performance			
- The minimum standard of performance assumes the partial acquisition, in proportion of 50%, of the basic knowledge of the discipline studied.			

Date of completion	Signature of course holder**	Signature of seminar laboratory/project holder **
25.05.2023	Prof.dr.eng. SABĂU NICU CORNEL nicusabau@yahoo.com	Lect. dr.eng VENIG-UNGUR Adelina adelina_venig@yahoo.com

Date of approval in the department	Signature of the Head of Department
25.05. 2023	Prof.dr.eng. SABĂU NICU CORNEL nsabau@uoradea.ro

Dean signature

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cristina_maerescu@yahoo.com

** - Name, first name, academic degree and contact details (e-mail, web page, etc)will be specified.

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Signature of the Head of Department***

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Dean Signature***

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*** - Name, first name, academic degree and contact details (e-mail, web page, etc) of the academic entity beneficiary of the Discipline Outlinewill be specified.

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