

**Discipline name: PEDOLOGY,**  
**Specialization: Landscape Architecture.**  
**Year II,**  
**Semester I**

**No. of transferable credits: 3**

**Discipline status: COMPULSORY / optional / facultative**

**Discipline holder: Assoc. Prof. Univ. Dr. TEODORESCU-SOARE Eugen-Gabriel**

### **Discipline objectives (course and applications):**

**General objectives:** Understanding the theoretical basis specific to the field of Pedology, acquiring and the skills to apply this theoretical knowledge in practice, as well as being able to act autonomously (i.e. observe, interpret, analyze) and provide solutions to concrete problems of general as well as specialized Pedology.

### **Specific objectives:**

- Knowledge of soil composition and its physical and chemical properties;
- Understanding of soil horizon formation;
- Characterization and description of the natural framework of soil formation and evolution;
- Characterization and description of soil profiles;
- Fieldwork: soil mapping;
- Morphological, physical and chemical description of the different soil types found in Romania according to the new "Romanian Soil Taxonomy System" (SRTS - 2003);
- Establishing the suitability and favorability of soils for land use and plant species cultivation.
- Well-founded choice of soils in which plant cultivation can be successfully extended, rational application of fertilizers and various amelioration processes.
- Understanding of soil as a living environment for plants in specific climates.

### **Discipline content**

#### **Course (Chapters and Subchapters)**

##### **1. Pedology – The science of soil:**

1.1. Pedology as a science; 1.2. Research methods in pedology; 1.3. Evolution of the Soli concept; 1.4. The evolution history of Pedology; 1.5. The evolution of soil knowledge in Romania; 1.6. The use of Pedology in different sectors of the Economy.

##### **2. Pedogenic factors:**

2.1. Rock solidification as a pedogenic factor ; 2.2. Organic residues in soil formation; 2.3. Climate effects in soil formation; 2.4. Vegetation effects in soil formation; 2.5. Microorganisms role in soil formation; 2.6. The role of fauna in soil formation; 2.7. Landscape role in soil formation; 2.8. Surface water role in soil formation; 2.9. Groundwater role in soil formation; 2.10. Human interference in soil formation.

##### **3. Mineral constituents in soils and their formation:**

3.1. Mineral components originating from rocks; 3. 2. Disaggregation of rocks and minerals; 3.3 Rock and mineral alteration processes.

##### **4. Organic soil constituents and their formation:**

4.1. Soil edaphon - the totality of living organisms; 4.2. Chemical composition of organic matter; 4.3. The humus formation; 4.4. Humic fractions; 4.5. Organic and mineral combinations; 4.6. Humus characterization indexes; 4.7. Humus types; 4.8. The importance of humus for the soil.

**5. Soil formation and composition:**

5.1. The soil profile; 5.2. Soil formation processes; 5.3. Pedogenic horizons.

**6. Morphological aspects:**

6.1. Soil structure 6.2. Soil color; 6.3. Soil neoformations.

**7. Physical properties of the soil:**

7.1. Soil texture; 7.2. Soil density; 7.3. The apparent density; 7.4. Soil porosity; 7.5. Soil mechanical properties.

**8. Chemical properties of the soil:**

8.1. Soil solution.

**9. Water and air in the soil:**

9.1. Physico-chemical properties of water; 9.2. Soil humidity; 9.3. Hydrophysical indexes; 9.4. Soil suction; 9.5. Water flow in nature, the contribution of water to soil formation; 9.6. The hydrological regime; 9.7. Water circulation in the soil; 9.8. Gas component in the soil.

**10. Thermal properties and soil temperature:**

10.1. Solar energy as main heating source; 10.2. Thermal properties of the soil; 10.3. Soil thermal regime.

**11. Soil classification and the natural framework for their formation in Romania:**

11.1. General aspects; 11.2. Characteristics of soil classifications; 11.3. Pedogenic classifications. 11.4. Morphologic classifications; 11.5. Soil taxonomy in Romania; 11.6. Soil formation framework in Romania.

**12. Protisols class:**

12.1. Preprotisols; 12.2. Regosols; 12.3. Psamosols; 12.4. Aluviosols; 12.5. Entiantrosols.

**13. Cernisols class:**

13.1. Kastanozoms; 13.2. Cernozoms; 13.3. Faeozoms ; 13.4. Rendzinic.

**14. Umbrisols class:**

14.1 Nigrosols; 14.2. Humosiosols.

**15. Cambisols class:**

15.1. Eutricambosols; 15.2. Districambosols.

**16. Luvisols class:**

16.1. Preluvosols; 16.2. Luvosols; 16.3. Planosols; 16.4. Alosols.

**17. Spodisols class:**

17.1. Prepodzols; 17.2. Podzols; 17.3. Criptopodzols.

**18. Pelisols class:**

18.1. Pelosols; 18.2. Vertosols.

**19. Andisols class:**

19.1. Andosols.

**20. Hydrisols:**

20.1. Stagnosols; 20.2. Gleiosols; 20.3. Limnosols.

**21. Salsodisols class:**

21.1. Aquisalids; 21.2. Solonetz.

**22. Histisols class:**

22.1. Histosols; 22.2. Foliosols.

**23. Antrisol:**

23.1 Erodosols; 23.2. Anthrosols.

**Practical Work****P.W.1**

Mineral recognition and study of their properties. Recognition and description of minerals in the class of elements, sulphides and halogenated salts. Characterization and recognition of minerals in the class of oxides and hydroxides. Recognition and description of minerals in the class of oxygenated salts. Description and characterization of minerals from the group of silicates (1<sup>st</sup> part). Description and characterization of minerals from the group of silicates (2<sup>nd</sup> part). Main features of igneous rocks. Classification of igneous rocks. Recognition and description of igneous rocks. Classification and description of metamorphic rocks. General characteristics of sedimentary rocks. Recognition and characterization of sedimentary rocks. Description and characterization of caustobioalytic rocks. Recognition of some mineral properties with the help of a polarizing microscope. Soil profile, pedogenic horizons, identification and analysis in the field.

**P.W.2**

Determination of the amount of alkaline earth carbonates present at a soil horizon through the Scheibler method, in the case of a cambic chernozem type soil sample.

**P.W.3**

Determination of the total content of slightly soluble salts through conductometric method, present at the salic horizon for a solonchac type soil sample.

**P.W.4**

Determination of the soil reactivity (pH) at the bioaccumulation horizon (Am), for a chernozem type soil in field and laboratory conditions.

**P.W.5**

Granulometric analysis and determination of soil texture, for a soil sample taken from a Bt horizon, for a argic chernozem soil type.

**P.W.6**

Presentation of the different horizons formed as an effect of the pedogenetic processes in field and laboratory conditions.

**P.W.7**

Characterization of the main soil types on monolithic and field samples (soil class according to S.R.T.S. – 2003).

**Referance list**

- <sup>1</sup> **Blaga Gh. Filipov F., Rusu I., Udrescu S., Vasile D.** - Pedologie. Ed. ACADEMIC PRESS, Cluj – Napoca, 2005.
- <sup>2</sup> **Filipov F., Lupascu Gh.** -Pedologie. Alcatuirea geneza si clasificarea solurilor. Editura. Terra nostra, Iasi, 2003
- <sup>3</sup> **Puiu S.,** - Pedologie. Ed. “Ceres” Bucuresti. 1980.
- <sup>4</sup> **Merlescu E.,** - Solurile României. Curs litografiat, IAI Ia i.
- <sup>5</sup> **Te u C.** - Pedologie, Atelierul de Multiplicare, Universitatea Agronomic Ia I 1994.
- <sup>6</sup> **Te u C., Avarvarei I.,** - Lucr ri practice Pedologie. Atelierul de Multiplicare, Universitatea Agronomic Ia i,1990.
- <sup>7</sup> **Teodorescu-Soare E.G., Gales D.C.** – Indrumator practic de analize fizice, chimice si morfologice ale probelor de sol, Ed. “ Ion Ionescu de la Brad” 2019.
- <sup>8</sup> **Teodorescu-Soare E.G.** – Ghid de aplicatii practice Pedologie-partea I-a,Iasi, 2012.
- <sup>9</sup> **Teodorescu-Soare E.G.** – Pedologie - Aplicatii practice – Ed. U.S.A.M.V. Iasi, 2012.
- <sup>10</sup> **Teodorescu-Soare E.G.** – Pedologie - Ed. U.S.A.M.V.Iasi, 2006.

**Final evaluation**

Activity type	10.1. Evaluation criteria	10.2. Evaluation methods	10.3. Final grade percentage (%)
<b>10.4. Course</b>	Knowledge acquirement	Oral examination	<b>60</b>
	Presence during lectures	Attendance	<b>10</b>
<b>10.5. Practical work</b>	Active participation in practical work	On-the-spot verification	<b>10</b>
	Practical skills	Colloquy	<b>20</b>
	Soil-profile morphology recognition. Case studies.		
<b>Performance standard</b>			
<b>Minimum requirements (for grade 5 from 10):</b> - attendance at all practical works (or complete restoration of those absent); - passing grades for the verification works during the semester; - successful outcome the colloquium; - minimum knowledge of the topic established for the exam.		<b>Maximum requirements (for grade 10 from 10):</b> - active participation in classes and during practical work; - synthesization ability and of all acquired knowledge; - obtaining the maximum scores on all indexes.	

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