

## Pedology (IInd Year of study, IIIrd Semester)

Credit value (ECTS) 5

### Course category

Domain (Imposed)

### Course holder:

PhD, Lect. Daniel Costel GALEŞ

### Discipline objectives (course and practical works)

The discipline "Pedology", in accordance with the analytical program, aims to:

- ✓ accumulation of knowledge regarding the composition and properties of the soil as a complex, polyphasic, polydispersed and multifunctional system; indicative recognition in the field of some soil constituents (rocks and some dominant minerals from pedogenetic horizons);
- ✓ accumulation of knowledge in order to identify in the field some properties of soils;
- ✓ the accumulation of knowledge necessary for the recognition in the field of the pedogenetic horizons and the establishment of the processes through which they were formed;
- ✓ the accumulation of knowledge necessary for the use of data from pedological studies in order to sustainably exploit soil resources.

### Contents (syllabus)

Course (chapters/subchapters)
<b>1. Pedology - soil science:</b> 1.1. Pedology - soil science; 1.2. Research methods specific to pedology; 1.3. The evolution of the concept of "soil; 1.4 Soil functions; 1.5 Living soil-plant on a planetary scale; 1.6 The usefulness of pedological studies in the agricultural and horticultural field.
<b>2. Mineral constituents of the soil and their formation:</b> 2.1. Rocks as a source of mineral compounds; 2. 2. Disaggregation of rocks and minerals; 2.3. Rock and mineral alteration processes.
<b>3. Organic constituents of the soil and their formation:</b> 3.1. Chemical composition of soil organic matter; 3.2. Humus formation 3.3. Humic fractions; 3.4. Indices used to characterize humus; 3.5. The importance of soil humus.
<b>4. Soil formation and composition:</b> 4.1. Soil profile; 4.2. Soil formation processes; 4.3. Pedogenetic horizons.
<b>5. Morphological properties:</b> 5.1. Soil structure; 5.2. Soil color; 5.3. Soil neoformations.
<b>6. Physical and chemical properties of the soil:</b> 6.1. Soil texture; 6.2. Soil density; 6.3. Apparent density; 6.4. Soil porosity; 6.5. Physical-mechanical properties. 6.6 Chemical properties of the soil; 6.7. Soil solution.
<b>7. Water and soil air:</b> 7.1. Physical and chemical properties of water; 7.2 Soil moisture; 7.3. Hydrophysical indices; 7.4. Soil suction; 7.5. Water circulation in nature, the effects of water action in soil formation; 7.6. Water regime; 7.7. Water circulation in the soil; 7.8. Soil gaseous component.

<b>8. Soil classification and their natural formation framework in Romania:</b> 8.1. Soil taxonomy in Romania; 8.2 The natural environment for soil formation in Romania.
<b>9. Protisols Class:</b> 9.1. Regosol; 9.2. Psamosol; 9.3 Alluviosol:
<b>10. Cernisols Class:</b> 10.1.Kastanosium; 10.2.Cernoziom; 10.3.Faeoziom; 10.4. Rendzinic.
<b>11. Cambisols Class:</b> 11.1. Eutricambosol; 11.2. Districambosol.
<b>12. Luvisols Class:</b> 12.1. Preluvosol; 16.2. Luvosol; Planosol; 12.4. Alosol.
<b>13. Hydrisols Class:</b> 13.1 .Stagnosol; 13.2. Gley; 13.3. Limnosol.
<b>14. Salsodisols Class:</b> 14.1. Solonchac; 14.2.Soloneț.
<b>15. Antrisol Class:</b> 15.1 Erodosol; 15.2. Antrosol.

Practicum
<b>1. Recognition and characterization of minerals and rocks that participate in soil formation.</b> 1.1. Identification and characterization of the main minerals from the groups oxides, haloid salts, sulfides, oxygenated salts, silicates. 1.2. Identification and characterization of the main metamorphic and sedimentary magmatic rocks and their grouping from a pedogenetic point of view.
<b>2. Determination by analytical laboratory methods of some physical and chemical properties of the soil.</b> 2.1. Preparation of soil samples for analysis and determination of hydrophysical properties directly or by calculation, humidity, hygroscopicity and wilting coefficient, useful water capacity, bulk density, total porosity and aeration. 2.2. Particle size analysis and soil texture determination. 2.3. Determination of the main chemical properties of the soil: humus, carbonates, soluble salts, pH, potential acidity, sum of exchangeable bases, degree of saturation in bases. Interpretation of the results obtained for desalinated profiles.
<b>3. Soil profile morphology.</b> 3.1. Soil profile horizons, diagnostic horizons. 3.2. Characterization of the main morphological indices of the soil in the field: consistency, effervescence, neoformations.
<b>4. Characterization of the main types of soil on monolithic and field samples.</b> 4.1. Characterization of soils in Romania, according to Romanian soil taxonomy system 2012.

## References

1. Blaga Gh. Filipov F., Rusu I., Udrescu S., Vasile D. - Pedologie. Ed. Academic Press, Cluj – Napoca, 2005.
2. Filipov F., Lupascu Ghe. -Pedologie. Alcatuirea geneza si clasificarea solurilor.Editura. Terra nostra, Iasi, 2003
3. Filipov F., - Pedologie. Ed. “Ion Ionescu de la Brad” Iași. 2005.
4. Merlescu Er., - Solurile României. Curs litografiat, IAI Iași.
5. Eugen Teodorescu-Soare; Daniel Costel Galeș, - Îndrumător practic de analize fizice, chimice și morfologice ale probelor de sol. Editura Ion Ionescu de la Brad, 2019.
6. Teșu C. - Pedologie, Atelierul de Multiplicare, Universitatea Agronomică Iași 1994.
7. Teșu C., Avarvarei I., - Lucrări practice Pedologie. Atelierul de Multiplicare, Universitatea Agronomică Iași,1990.
8. Teodorescu Soare Eugen, 2012- Pedologie. Minerale și roci. Îndrumător practic

## Evaluation

Evaluation forms	Evaluation Methods	Percentage of the final grade
Exam	Oral examination	60%
Appreciation of the activity during the semester	Oral assessment during the semester, verification tests and final laboratory colloquium.	40%

## Contact

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