UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
Facultatea de Agricultură
Calea Mănăştur 3-5, 400372, Cluj-Napoca, România
Tel: 0264-596.384, Fax: 0264-593.792
www.usamvcluj.ro

SUBJECT OUTLINE

1. Information on the programme

1.1. Higher education institution	**University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca**
1.2. Faculty	**Agriculture**
1.3. Department	**Environmental and Plant Protection**
1.4. Field of study	Environmental Engineering
1.5. Cycle of study[1]	Bachelor / Master
1.6. Specialization/ Study programme	**Environmental Engineering**
1.7. Form of education	Full time

2. Information on the discipline

2.1. Discipline name	**Soil Science**							
2.2. Course coordinator				Prof. PĂCURAR IOAN PhD				
2.3. Seminar/ laboratory/ project coordinator				Chief Lab BUTA MIHAI PhD				
2.4. Year of study	I	2.5. Semester	I	2.6. Evaluation type	Summative	2.7. Discipline status	Content[2]	DD
							Compulsoriness[3]	DI

3. Total estimated time (teaching hours per semester)

3.1. Hours per week – full time programme	**4**	**out of which: 3.2. lecture**	**2**	**3.3. seminar/ laboratory/ project**	**2**
3.4.Total number of hours in the curriculum	**56**	**out of which: 3.5. lecture**	**28**	**3.6.seminar/laboratory**	**28**

Distribution of the time allotted	**hours**
3.4.1. Study based on books, textbooks, bibliography and notes	10
3.4.2. Additional documentation in the library, electronic platforms and field experiences	10
3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays	6
3.4.4. Tutorials	4
3.4.5. Examinations	4
3.4.6. Other activities	

3.7. Total hours of individual study	34
3.8. Total hours per semester	90
3.9. Number of credits[4]	3

4. Prerequisites (if applicable)

4.1. curriculum-related	Basic knowledge about geological and pedogenetical processes, as well as inter-conditioning them with vegetation floor; agro-meteorology and botany.	
4.2. skills-related	Students must acquire basic concepts about the function of ecosystems, as well as modelling/transformation processes of the pedogenetic cover and their properties.	

5. Conditions (if applicable)

5.1. for the course	The course is interactive, illustrated with pictures and sketches in Power Point. Students can ask questions about the content of the exhibition. The university discipline requires the observance of the starting and finishing time of the course.

	closed.
5.2. for the seminar/ laboratory/ project	At the practical work it is compulsory to consult the practical tutor, each student will carry out an individual activity with the laboratory equipment provided and follow the instructions of the labor protection when using laboratory reagents and chemicals. Academic discipline is required for the entire duration of the work.

6. Cumulated specific competences

Professional competences	To know the geological and geomorphological knowledge. To know the basics concepts about the genesis, evolution and knowledge of soil cover from main natural areas in the country To acquire the main aspects regarding the evolution of soil as life environment for plants To know the main genetic soil types
Transversal competences	Students must acquire knowledge about the formation of soils. To familiarize students with the basic notions about the genesis, evolution and knowledge of pedogenetic layer of the main pedo-phito-climatic areas from our country.

7. Discipline objectives (based on the cumulated specific competences)

7.1. General objective	Deepening the students' knowledge of the event main factors governing natural processes at the surface and interior of the earth, geological processes, pedogenetical and their interacting with floors of vegetation. Knowledge of the factors and processes of soil formation in assessing land use. Analyze and apply practical importance in achieving physical and chemical properties of agricultural production
7.2. Specific objectives	Acquiring knowledge of the geological evolution of the earth, lithological substrate material alteration that causes the differentiation of the soil profile depth and knowledge horizons pedogenetical and their properties. Acquiring students with the main issues that soil evolution living environment of plants and knowledge of the main genetic types of soil in Romania, their fertility and possibilities of exploitation and improvement. To determine in laboratory and filed the properties of soil.

8. Content

8.1. COURSE **Number of hours –**	Teaching methods	Observation
1. Geospheric structure of the earth;	Lecture	1 lecture = 2 hours
2. Global tectonics - major mechanism in geological evolution;	Lecture	1 lecture = 2 hours
3. Soil mineralogy (properties, genesis, classification);	Lecture	1 lecture = 2 hours
4. Petrographic elements - magmatic rocks, metamorphic rocks, sedimentary rocks;	Lecture	1 lecture = 2 hours
5. Elements of paleontology and geology, geological eras;	Lecture	1 lecture = 2 hours
6. Geology and geomorphology of the relief of Romania;	Lecture	1 lecture = 2 hours
7. The lithological substrate-the bark of alteration and pedogenetics, the interrelation relief-climate-vegetation-soi;	Lecture	1 lecture = 2 hours
8. Forming the mineral and organic part of the soil. Forming the soil profile. Pedogenetic processes;	Lecture	1 lecture = 2 hours
9. The main properties of soils. Physical and physical-mechanical properties and chemical properties;	Lecture	1 lecture = 2 hours
10. Nutrients from soil - Microelements as ecological factor and microelements as ecological factor;	Lecture	1 lecture = 2 hours
11. Classification of Romania's soils, soils from the steppe area, silvostepa area;	Lecture	1 lecture = 2 hours
12. Soils in the forest area of the hill;	Lecture	1 lecture = 2 hours
13. Soils from the mountain forest area and soils from the alpine meadows area	Lecture	1 lecture = 2 hours
14. Azonal intrazonal soils (lithomorphic, hydromorphic, halomorphic)	Lecture	1 lecture = 2 hours

8.2. PRACTICAL WORKS Number of hours –	Teaching methods	Observation
1. Primary minerals from parental rocks. Testing theoretical knowledge by recognition of minerals and rocks	Theoretical presentation of practical works	1 lab work (2 h/work)
2. Endogenous magmatic parental rocks,	Laboratory. The study of rocks	1 lab work (2 h/work)
3. Metamorphic endogenous parental rocks	Laboratory. The study of rocks	1 lab work (2 h/work)
4 Sedimentary exogenous parental rocks	Laboratory. The study of rocks	1 lab work (2 h/work)
5. Testing theoretical and practical knowledge by recognizing minerals and rocks	Testing review	1 lab work (2 h/work)
6. Granulometric analysis and soil texture determination	Laboratory. Analyses	1 lab work (2 h/work) 1
7. Hydrophysical indexes of the soil (CH, CO, CC, CU, CT, PM)	Laboratory. Analyses	lab work (2 h/work)
8. Determination of soil reaction	Laboratory. Analyses	1 lab work (2 h/work) 1
9. Determination of CaCO3 in soil	Laboratory. Analyses	lab work (2 h/work) 1
10. Establishing the degree of saturation in bases (SH and SB determination; T and V calculation)	Laboratory. Analyses	lab work (2 h/work)
11. Determination of soil humus	Laboratory. Analyses	1 lab work (2 h/work)
12. Morphological study of soil profile, diagnostic horizons and parental diagnostic materials (didactic collection of monoliths).	Theoretical presentation of practical works	1 lab work (2 h/work)
13. Morphological study of the main soil types in Transylvania, field research of a Cernisol-rendzina (Val Garbaului) and of an alvis luvisol-luvisol, Manastur forest.	Theoretical presentation of practical works	1 lab work (2 h/work)
14. Testing the theoretical and practical knowledge regarding the determination and interpretation of the physical and chemical properties of the soil and the description of the micromonolites	Testing review	1 lab work (2 h/work)

Compulsory bibliography:

- PĂCURAR I., (2000), - Pedologie generală şi bonitatea terenurilor agricole – curs;
- PĂCURAR I., BUTA M., (2010), - Pedologie şi bonitarea terenurilor agricole-lucrări practice, Ed. RisoPrint;
- PĂCURAR I., (2006), - Pedologie şi staţiuni forestiere, Ed. Risoprint;
- MÂRZA, CONSTANTINA C. (2005), Elemente de geologie şi geomorfologie aplicată domeniului agrosilvic, Ed. Todescu.

Optional bibliography:

- BLAGA si colab. (2008), - Pedologie, Ed. Mega

9. Corroborating the discipline content with the expectations of the epistemic community representatives, of the professional associations and of the relevant employers in the corresponding field

In order to identify ways of modernizations and continuous improvement of teaching the course content, along with the newest themes and practical issues, teachers participate on different debates, symposium and conferences, at national and international level.

10. Evaluation

Type of activity	10.1. Evaluation criteria	10.2. Evaluation type	10.3. Percentage of the final grade
10.4. Course	- Response for the topic extracted at oral exam - The activity at discipline	Summative(E)	Oral exam 70%
10.5. Seminar/Laboratory	- Recognise the minerals and rocks - Determination and interpretation of physical and chemical properties of soil	Two parts of test of the evaluation of accumulated knowledge to practical work)	30%
10.6. Minimum performance standards			
Mastery of scientific information transmitted through lectures and practical work at an acceptable level. Getting the pass mark in test evaluation is a condition of graduation.			

[1] Cycle of studies - choose one of the three options: Bachelor/Master/Ph.D.
[2] according to the educational plan
[3] Discipline status (compulsoriness) - choose one of the options – **DI** (compulsory discipline) **DO** (optional discipline) **DFac** (facultative discipline).
[4] One credit is equivalent to 25-30 hours of study (teaching activities and individual study).

Filled in on
04.09.2019

Course coordinator
Prof. PĂCURAR IOAN PhD

Laboratory work/seminar coordinator
Chief Lab BUTA MIHAI PhD

Approved by the
department on
05.092019

Head of the Department
Prof. Oroian Ioan PhD