Annex 6

SUBJECT OUTLINE

1. Information on the study programme

1.1 Academic institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**FACULTY OF ENVIRONMENTAL PROTECTION**
1.3 Department	**FORESTRY AND FOREST ENGINEERING**
1.4 Field of study	**FORESTRY**
1.5 Cycle of study	**MASTER**
1.6 Study programme/Qualification	**SUSTAINABLE RECOVERY OF FOREST RESOURCES / ENGINEER**

2. Information on the discipline

2.1 Name of discipline				**TYPOLOGY OF FOREST ECOSYSTEMS**			
2.2 Course holder				Lecturer **MOȚIU PETRICĂ TUDOR**, Eng. PhD			
2.3 Seminar/Laboratory/Project holder				Lecturer **MOȚIU PETRICĂ TUDOR**, Eng. PhD			
2.4 Year of study	I	2.5 Semester	II	2.6 Type of evaluation	Summative	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	2	out of which: 3.2 course	1	out of which 3.3 seminar/laboratory/project	1
3.4 Total hours in the curriculum	28	out of which: 3.5 course	14	out of which 3.6 seminar/laboratory/project	14

Time allotment	hours
Study assisted by manual, course support, bibliography and notes	**20**
Additional documentation in the library/ on specialised electronic platforms and in the field	**29**
Preparation of seminars/laboratories/ topics/reports, portfolios and essays	**20**
Tutorship	**20**
Examinations	**8**
Other activities.....	**-**

3.7 Total hours of individual study	**55**
3.9 Total hours per semester	**124**
3.10 Number of credits	**5**

4. Pre-requisites (where appropriate)

4.1 curriculum	Pedology, Dendrology, Meteorology, Systematic botany, Forest ecology, Forest sites, Forestry.
4.2 competences	General notions regarding the forest typology.

5. Conditions (where appropriate)

5.1. related to course	Video projector, computer, drawings
5.2. related to seminar/laboratory/ project	Equipment related to the development of laboratory hours (color plates, pedological kits for the field, computers, agricultural tools, general regulations). Carrying out all laboratory work

6. Specific competences acquired	
Professional competences	C1.5 Carrying out projects to assess the diversity of forest ecosystems using classical and modern, quantitative and qualitative methods C2.2 Use of expertise to explain and interpret the interaction of forest ecosystems with agroecosystems and the environment C3.1 Assessment and characterization of risk factors (biological, physical, chemical and social - management, protection and exploitation) on forest ecosystems.
Transversal competences	CT1. Executing of one's own attributions with professionalism and rigor and making specific decisions for teamwork in accordance with deontological values and principles.

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

7.1 General objective	The course "Typology of Forest Ecosystems" aims to familiarize students with the basics of forest typology (brief history, definitions, classifications, etc.). Through the wealth of scientific data it provides (diagnosis and description of forest ecosystem types; typology and mapping of forest ecosystems; description of the main types of forest ecosystems in Romania; knowledge of the main processes within the forest ecosystem; knowledge of the factors influencing the quality of forest sites, limiting seasonal factors, forestry recommendations needed to be applied for each type of ecosystem in order to increase seasonal viability and productivity of trees for sustainable management) this activity will be able to contribute in the future to a rational management of forests.
7.2 Specific objectives	The laboratory works are designed to provide forestry engineers with theoretical and practical aspects of forest management in order to maintain the natural fundamental types and their ecological reconstruction (in the case of derived stands and artificially incompatible ones in the season). Master students will

	acquire practical skills in identifying (in the field) and describing the types of forest, types of forest sites and types of forest ecosystems in our country.

8. Contents*/

8.1 Course	Methods of teaching	No. of hours/Remarks
1. Foreword. Introduction. State of knowledge: General aspects; Formation of the forest typology	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
2. Formation of forest typology: In Russia - G. F. Morozov; In Finland - A. Cajander. Forest typological systems and schools: Russian typological system and school (Sukacev); Ukrainian typological system and school (Pogrebneak); German typological system (Krauss - Schlenker); French typological system; The Swiss typological system.	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
3. The Italian typological system; Spanish typological system; Czechoslovak typological system (Zlatnik); Forest classification system in Anglo-Saxon countries; The typological system in Canada; The typological system in the United States of America. Phytocenological systems for classifying forest vegetation; Ecosystem conception in the typological classification of forests.	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
4. Development of the forest typology in Romania: Beginnings; Typological schools in Romania: Paşcovschi School. Types of forests; Chiriţă School. Types of forest sites;	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
5. Ecosystem typology.	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
6. Research methodology of forest types, resort types and forest ecosystem types. Forest type research method. Criteria for differentiating the types used in forest typology: Stand; Underwood and vegetable layer; Edaphic characters; Climatic characters; Forestry measures; Minimum area. Field data collection: General information on the execution of surveys; Description of the old tree; Natural regeneration research;	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
7. Description of the underwood; Description of the vegetable layer; Description of the dead vegetable layer; Description of forest sites factors; Additional data; How to record data in the field.	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
8. Data processing at the office; Name of forest types; Typological mapping.	Video projector. Some courses are conducted	1

	by teaching the topics and debating them by master students.	
9. Study of the forest sites; Study objectives and appropriate working methodologies; Size classes and favorability classes of ecological factors, optimal quantitative criteria for ecological and bioproductive interpretation of the forest sites;	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
10. The method of establishing the types of forest sites (forest sites syntheses); Recognition of types of forest sites;	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
11. Typology of forest ecosystems. Theoretical and methodological premises for the elaboration of a forest typology on ecosystem basis: Theoretical premises; Forest ecosystem classification units;	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
12. Nomenclature of classification units; Coding of classification units; Characterization of forest ecosystem types. Reconsideration of the types of grassy-undershrub layer. Framing of certain special categories of forest ecosystems.	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
13. Relationships between forest ecosystem types, forest types and forest resort types. The current state of knowledge of forest ecosystem types and perspective issues. The use of ecosystem typology in forest conservation and management.	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1
14. Conclusions and perspectives.	Video projector. Some courses are conducted by teaching the topics and debating them by master students.	1

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2. Ciocârlan, V., 2000. *Flora ilustrată a României*. Editura Ceres, Bucureşti.
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Bucuresti.
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8.2 Laboratory	Methods of teaching	No. of hours/ Remarks
1. Introduction. Classification used in the typology of forest ecosystems	In the first hour there will be a training related to the protection of laboratory-specific work and practical work in the field. Presentation of theoretical and practical aspects related to the subject. Interactive	1
2. Main types of forest ecosystems within the group of formations "Norway spruce stands and forests mixed with Norway spruce, arolla pine stands, larch stands and mixed forests with European larch"	Presentation of theoretical and practical aspects related to the subject. Interactive	1
3. Main types of forest ecosystems within the group of formations "Silver fir stand and mixed forests with European silver fir"	Presentation of theoretical and practical aspects related to the subject. Interactive	1
4. Main types of forest ecosystems within the group of formations "European beech stands and mixed forests with common beech (Fagus sylvatica ssp. sylvatica), European ash - Norway maple stands, pin-wood of Scots pine"	Presentation of theoretical and practical aspects related to the subject. Interactive	1
5. Main types of forest ecosystems within the group of formations "European beech stands and mixed forests with common beech (Fagus sylvatica ssp. moesiaca), pin-wood of European black pine"	Presentation of theoretical and practical aspects related to the subject. Interactive	1
6. Main types of forest ecosystems within the group of formations "Sessile oak stands and mixed forests with sessile oak"	Presentation of theoretical and practical aspects related to the subject. Interactive	1
7. Main types of forest ecosystems within the group of formations "Oak stands and mixed forests with common oak"	Presentation of theoretical and practical aspects related to the subject. Interactive	1
8. Main types of forest ecosystems within the group of formations "Turkey oak stands, Hungarian oak stands, Turkey oak-Hungarian oak stands and mixed forests with Turkey oak and (or) Hungarian oak"	Presentation of theoretical and practical aspects related to the subject. Interactive	1
9. Main types of forest ecosystems within the group of formations "Oak stands with xerophilous oaks"	Presentation of theoretical and practical aspects related to the subject. Interactive	1
10. Main types of forest ecosystems within the	Presentation of theoretical and	1

group of formations "Groves"	practical aspects related to the subject. Interactive	
11. The main types of forest ecosystems within the formations "ash-forests with meadow European ash" and common elm stands with meadow common elms"	Presentation of theoretical and practical aspects related to the subject. Interactive	1
12. Mapping the types of forest ecosystems	Presentation of the phase of forest ecosystems mapping	1
13. Practical works performed in the field.	Presentation of the theoretical and practical aspects related to the subject, lecture, practical activity	2

Bibliography

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14. Târziu, D. R., 2006. *Pedologie şi staţiuni forestiere.* Editura Silvodel, Braşov.

* 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

The content of the discipline is adapted and satisfies the requirements imposed by the labor market, being agreed by social partners, professional associations and employers in the field related to the master's program. The content of the discipline is found in the curriculum of Forestry and other university centers in Romania that have accredited these specializations, so knowledge of the basics of "Typology of Forest Ecosystems" is a stringent requirement of employers in forestry and forestry, such as : RNP, ICAS, IFN, etc.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of the final grade
10.4 Course	- for grade 5 it is necessary to have a constructive and functional knowledge of the machinery and equipment used in forestry. - for grade 10, a thorough knowledge of all subjects is required.	Oral examination.	75%
10.5 Seminar			
10.6 Laboratory	In the last laboratory session the students will present the laboratory works performed.	Practical exam	25 %
10.7 Project	-		
Grade components: Exam (Ex), Laboratory (L); - Note calculation formula: N = 0.75Ex + 0.25L; - Condition for obtaining loans: N> 5; L> 5;			
10.8 Minimum standard of performance			
Carrying out the works under the coordination of a teacher, in order to solve specific problems in the field of forestry and forestry, with the correct evaluation of the workload, available resources, necessary completion time and risks, in conditions of application of occupational safety and health norms..			

Date of completion
02.10.2020

Signature of course holder**
Lecturer Moțiu Petrică Tudor, Eng. PhD

Signature of seminar laboratory/project holder **
Lecturer Moțiu Petrică Tudor, Eng. PhD

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Date of approval in the department
05.10.2020

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

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