

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY NATIONAL AGRARIAN UNIVERSITY
Faculty of Agrotechnologies and Natural Resource Management
Department of Ecology and Botany

MODULE SYLLABUS

OC 1. FOREST ECOLOGY

(optional)

Implemented in the “Ecology” Academic Program

Area of specialization: 101 “Ecology”

at the third (educational and scientific) level of higher education

Sumy – 2021

Author:

I. M. Kovalenko, Doctor of Biological Sciences, Professor of Ecology and Botany Department

Module syllabus viewed and agreed at the Ecology and Botany Department meeting	Minutes № 19 dated June 07, 2021
	<p>Head of Department</p> <p style="text-align: center;"> _____ (signature)</p> <p style="text-align: right;"><u>V. G. Skliar</u> (surname, initials)</p>

Approved by:

Guarantor of the Academic program

I. M. Kovalenko

Dean of the Faculty

I. M. Kovalenko

Syllabus review (attached) is provided by :

V. G. Skliar

G.O. Klymenko

Syllabus review data:

The academic year in which changes are made	The Academic program attachment number with changes description	Changes revised and approved		
		Minutes No and date of the department meeting	Head of Department	Guarantor of the Academic program

1. 1. MODULE OVERVIEW

1.	Title	FOREST ECOLOGY					
2.	Faculty/Department	Faculty of Agrotechnologies and Natural Resource Management Department of Ecology and Botany					
3.	Type (compulsory or optional)	Optional					
4.	Program(s) to which module is attached						
5.	Module can be suggested for (to be filled in for optional types)	Academic program “ Ecology ” Area of specialization 101 “ Ecology ”					
6.	Level of the National Qualifications Framework	8 level					
7.	Semester and duration of module	IV semester					
8.	ECTS credits number	5 (150 hours)					
9.	Total workload and time allotment	Directed study				Self-directed study	
		Lectures	Practicals	Labs			
		20	30		100		
10.	Language of instruction	Ukrainian, English					
11.	Module leader	Kovalenko Igor Mykolajovych, PhD in Biology, Professor of Ecology and Botany Department					
11.1	Module leader contact information	kovalenko_977@ukr.net , room 204a					
12.	Module description	Specific tasks of the discipline are to master the laws of forest development, the relationship of forests and environmental factors, the relationship of individual tree species and their groups to environmental factors, as well as features and patterns of forest impact on the environment, elucidation of assets and prospects of forest ecology.					
13.	Module aim	Formation of in-depth knowledge of ecological laws and relationships that determine the formation of forest ecosystems and their role in the biosphere.					
14.	Module Dependencies (prerequisites, co-requisites, incompatible modules)	The educational component is based on the study of such disciplines as: “Population ecology”, “A Plant in the experiment”, “Research methodology”.					
15.	The policy of academic integrity	PhD student must follow the rules of academic integrity doing the practical tasks, writing modular, attestation, test and examination tasks. If the facts of copying or academic dishonesty are identified, the work done by the PhD student is not credited.					
16.	Link in Moodle	https://cdn.snau.edu.ua/moodle/course/view.php?id=3647					

**2. CORRELATION BETWEEN MODULE LEARNING OUTCOMES (MLOs)
AND PROGRAM LEARNING OUTCOMES (PLOs)
(101 “Ecology”)**

MLOs: On successful completion of the module the PhD student will be able to:	PLOs (indicate the number according to the numbering given in the AP)¹			How assessed
	PLOs₁ Demonstrate a deep knowledge of the advanced conceptual and methodological foundations of the natural sciences, which makes it possible to rethink and deepen the science of the environment.	PLOs₂ Demonstrate mastery of general scientific concepts of modern science.	PLOs₁₄ Be able to assess the degree, nature of the negative impact of agricultural production and other types of anthropopression on humans, biodiversity, the environment, assess risks and propose measures for the greening of the agro-sphere.	
MLOs 1. Operate the basic concepts of forest ecology.	X			Report, discussion, survey, test control.
MLOs 2. Obtain knowledge about the impact of environmental factors on the forest and the environment.	X		X	Report, discussion, survey, test control. Preparation of a report with a multimedia presentation. Checking and analysis of completed tasks.
MLOs 3. Know about the possibilities of forestry in improving the ecological conditions of forests and adjacent areas.		X	X	Report, discussion, survey, test control. Preparation of a report with a multimedia presentation. Checking and analysis of completed tasks.
MLOs 4. Know the principles of phytocenological construction and forest-ecological classification of forest types.	X		X	Report, discussion, survey, test control. Preparation of a report with a multimedia presentation. Checking and analysis of completed tasks. Mastering skills and abilities in observation.
MLOs 5. Possess modern classifications in Ukraine and foreign countries.	X	X		Report, discussion, survey, group work, test control. Preparation of a report with a multimedia presentation. Checking and analysis of completed tasks. Observation of PhD students in the process of performing tasks.

3. MODULE INDICATIVE CONTENT

Topics. (List of issues to be addressed within the topic)	Distribution of hours				Learning resources
	Directed study			Self-directed study	
	Lectures	Practicals	Labs		
Topic 1. Fundamentals of forest ecology.	2	3		10	1,2,3,4
Topic 2. Biosphere, ecological and economic role of forest ecosystems.	2	3		10	1,2,3,4,9
Topic 3. Ecology of the main forest-forming species.	2	3		10	1,2,3,4,8
Topic 4. Ecology of plants of the lower tiers of forest ecosystems.	2	3		10	1,2,3,4,11, 12, 14, 16
Topic 5. Ecological bases of classification and typology of Ukrainian forests.	2	3		10	1,2,3,4,7
Topic 6. Reproduction of forest-forming tree species is the basis of the reforestation process.	2	3		10	3,4,6,9
Topic 7. Basic principles of ecologically oriented forestry.	2	3		10	5,7,9,11
Topic 8. Sustainability of forest ecosystems.	2	3		10	1,2,3,10
Topic 9. Basic principles of reforestation in the aspect of ecologically-oriented forestry.	2	3		10	1,2,3,4,7
Topic 10. Environmental problems of afforestation in Ukraine.	2	3		10	8,9,11
Total hours	20	30		100	

4. TEACHING AND LEARNING METHODS

MLOs	Teaching methods (directed study)	Hours	Learning methods (self-directed study)	Hours
MLOs 1. Operate the basic concepts of forest ecology	conducting lectures using multimedia presentations and calculated practical work	10	- studying of unknown (new) terms, - studying of additional material on relevant topics.	20
MLOs 2. Obtain knowledge about the impact of environmental factors on the forest and the environment	conducting lectures using multimedia presentations and calculated practical work	10	- studying of additional material on relevant topics, - analysis of the work done in carrying out the tasks and preparation for the defense of papers, - writing essays and / or abstracts.	20
MLOs 3. Know about the possibilities of forestry in improving the ecological conditions of forests and adjacent areas	conducting lectures using multimedia presentations and calculated practical work	10	- studying of additional material on relevant topics, - analysis of the work done in carrying out the tasks and preparation for the defense of papers, - writing essays and / or abstracts.	20
MLOs 4. Know the principles of phytocenological construction and forest-ecological classification of forest types	conducting lectures using multimedia presentations and calculated practical work	10	- studying of additional material on relevant topics, - analysis of the work done in carrying out the tasks and preparation for the defense of papers, - writing essays and / or abstracts.	20
MLOs 5. Possess modern classifications in Ukraine and foreign countries	conducting lectures using multimedia presentations and calculated practical work	10	- studying of additional material on relevant topics, - analysis of the work done in carrying out the tasks and preparation for the defense of papers, - writing essays and / or abstracts.	20
Total hours		50		100

5. ASSESSMENT

5.1. Summative assessment

5.1.1. To assess the expected learning outcomes provided

№	Summative assessment methods	Grades	Deadline
Module 1			
1.	Practical work 1.1. Genesis of forest ecosystems. Succession.	3 grades /3%	Up to 3 week

2.	Practical work 1.2.Forest ecosystems in the context of global warming.	3 grades /3%	Up to 4 week
3.	Practical work 1.3.General patterns of woody plants ontogenesis.	3 grades3%	Up to 5 week
4.	Practical work 1.4. Phenological rhythms – indicators of ecological conditions.	3 grades /3%	Up to 6 week
5.	Practical work 1.5. Principles of forest ecosystems classification.	3 grades/3%	Up to 7 week
6.	Modular control	5 grades /5%	Up to 8 week
7.	Attestation (multiple choice test)	15 grades /15%	Up to 8 week
Module 2			
8.	Practical work 2.1. Features of the reproductive process in gymnosperms and angiosperms.	4 grades/4%	Up to 10 week
9.	Practical work 2.2. Strategic principles of ecologically oriented forestry.	4 grades/4%	Up to 11 week
10.	Practical work 2.3. Ecological optimization and restoration of forest ecosystems.	4 grades/4%	Up to 12 week
11.	Practical work 2.4. Forest crops and problems of their sustainability.	4 grades/4%	Up to 13 week
12.	Practical work 2.5. Afforestation on the basis of ecologically oriented forestry.	4 grades/4%	Up to 14 week
13.	Modular control	15 grades / 15%	Up to 15 week
14.	Exam	30 grades/30%	Examination period

5.1.2. ASSESSMENT CRITERIA

Component	Unsatisfactory	Satisfactory	Good	Excellent
Module 1				
Practical work 1.1. Genesis of forest ecosystems. Succession.	<i>0 grades</i>	<i>1 grade</i>	<i>2 grades</i>	<i>3 grades</i>
	Practical work is not done or done improperly	Not all tasks are calculated	All requirements and tasks are fulfilled, but the PhD student is not sufficiently versed in the theoretical material	All requirements and tasks are fulfilled, the obtained results are clearly interpreted, the opinion and the vision of a certain problem are formed.
Practical work 1.2. Forest ecosystems in the context of global warming.	<i>0 grades</i>	<i>1 grade</i>	<i>2 grades</i>	<i>3 grades</i>
	Practical work is not done or done improperly	Not all tasks are calculated	All requirements and tasks are fulfilled, but the PhD student is not sufficiently versed in the theoretical material	All requirements and tasks are fulfilled, the obtained results are clearly interpreted, the opinion and the vision of a certain problem are formed.
Practical work 1.3. General patterns of woody plants ontogenesis.	<i>0 grades</i>	<i>1 grade</i>	<i>2 grades</i>	<i>3 grades</i>
	Practical work is not done or done improperly	Not all tasks are calculated	All requirements and tasks are fulfilled, but the PhD student is not sufficiently versed in the theoretical material	All requirements and tasks are fulfilled, the obtained results are clearly interpreted, the opinion and the vision of a certain problem are formed.
Practical work 1.4.	<i>0 grades</i>	<i>1 grade</i>	<i>2 grades</i>	<i>3 grades</i>

Phenological rhythms – indicators of ecological conditions.	Practical work is not done or done improperly	Not all tasks are calculated	All requirements and tasks are fulfilled, but the PhD student is not sufficiently versed in the theoretical material	All requirements and tasks are fulfilled, the obtained results are clearly interpreted, the opinion and the vision of a certain problem are formed.
Practical work 1.5. Principles of forest ecosystems classification.	<i>0 grades</i>	<i>1 grade</i>	<i>2 grades</i>	<i>3 grades</i>
	Practical work is not done or done improperly	Not all tasks are calculated	All requirements and tasks are fulfilled, but the PhD student is not sufficiently versed in the theoretical material	All requirements and tasks are fulfilled, the obtained results are clearly interpreted, the opinion and the vision of a certain problem are formed.
Modular control : test, oral questioning, written test (at the discretion of the module leader)	<i>0-5 grades</i>			
	Assessed based on the number of correct answers			
Attestation (multiple choice test)	<i>0-3 grades</i>	<i>3-7 grades</i>	<i>7-13 grades</i>	<i>13-15 grades</i>
	Depends on the number of correct answers to the test	Depends on the number of correct answers to the test	Depends on the number of correct answers to the test	Depends on the number of correct answers to the test
Module 2				
Practical work 2.1. Features of the reproductive process in gymnosperms and angiosperms.	<i>0-1 grades</i>	<i>2 grades</i>	<i>3 grades</i>	<i>4 grades</i>
	Practical work is not done or done improperly	Not all tasks are calculated	All requirements and tasks are fulfilled, but the PhD student is not sufficiently versed in the theoretical material	All requirements and tasks are fulfilled, the obtained results are clearly interpreted, the opinion and the vision of a certain problem are formed.
Practical work 2.2. Strategic principles of ecologically oriented forestry.	<i>0-1 grades</i>	<i>2 grades</i>	<i>3 grades</i>	<i>4 grades</i>
	Practical work is not done or done improperly	Not all tasks are calculated	All requirements and tasks are fulfilled, but the PhD student is not sufficiently versed in the theoretical material	All requirements and tasks are fulfilled, the obtained results are clearly interpreted, the opinion and the vision of a certain problem are formed.
Practical work 2.3. Ecological optimization and restoration of forest ecosystems.	<i>0-1 grades</i>	<i>2 grades</i>	<i>3 grades</i>	<i>4 grades</i>
	Practical work is not done or done improperly	Not all tasks are calculated	All requirements and tasks are fulfilled, but the PhD student is not sufficiently versed in the theoretical material	All requirements and tasks are fulfilled, the obtained results are clearly interpreted, the opinion and the vision of a certain problem are formed.
Practical work 2.4. Forest crops and problems of their sustainability.	<i>0-1 grades</i>	<i>2 grades</i>	<i>3 grades</i>	<i>4 grades</i>
	Practical work is not done or done improperly	Not all tasks are calculated	All requirements and tasks are fulfilled, but the PhD student is not sufficiently versed in the theoretical material	All requirements and tasks are fulfilled, the obtained results are clearly interpreted, the opinion and the vision of a certain problem are formed.

Practical work 2.5. Afforestation on the basis of ecologically oriented forestry.	<i>0-1 grades</i>	<i>2 grades</i>	<i>3 grades</i>	<i>4 grades</i>
	Practical work is not done or done improperly	Not all tasks are calculated	All requirements and tasks are fulfilled, but the PhD student is not sufficiently versed in the theoretical material	All requirements and tasks are fulfilled, the obtained results are clearly interpreted, the opinion and the vision of a certain problem are formed.
Modular control: test, oral questioning, written test (at the discretion of the module leader)	<i>0-15 grades</i>			
	Assessed based on the number of correct answers.			
Exam	<i>0-5 grades</i>	<i>5-15 grades</i>	<i>15-27 grades</i>	<i>30 grades</i>
	The PhD student is not sufficiently versed in the theoretical material, the tasks are not completed	The PhD student is not sufficiently versed in the theoretical material, the tasks are done with mistakes	The PhD student is sufficiently versed in the theoretical material, the tasks are completed	The PhD student is well versed in the theoretical material, all tasks are completed

5.2. Formative Assessment

№	Formative Assessment elements	Date
1	Oral questioning after studying each topic	After completing the study of the topic
2	Oral answers to individual questions during lectures and practicals	Throughout the semester
3	Analysis of texts on the topics of the course worked out by the PhD student individually	Throughout the semester
4	Defence of practical work	After completing of work
5	Oral feedback from the tutor when working on practicals.	Throughout the semester

6. LEARNING RESOURCES

Key resources

- Лісовий кодекс України. (Закон України №3404-IV. Ухвалений Верховною Радою 13 березня 2006 року) // <https://zakon.rada.gov.ua/laws/show/3852-12#Text>
- Свириденко В.Є. Лісівництво. Цикл лекцій. Навчальний посібник. - К., Арістей, 2007. – 391 с.
- Свириденко В.Є., Бабіч О.Г., Киричок Л.С. Лісівництво. Підручник / За ред.В.Є. Свириденка. – К.: Арістей, 2004.-544 с.
- Свириденко В.Є. Лісова екологія та типологія. Курс лекцій. - К.: НАУ, 2004.- 80 с.
- Злобін Ю. А. Загальна екологія / Ю. А. Злобін, Н. В. Кочубей. – Суми : Університетська книга, 2003. – 414 с.
- Григора І.М., Соломаха В.А. Основи фітоценології.– К.: Фітосоціоцентр, 2000. – 240 с.
- Григора І.М., Якубенко Б.Є. Фітоценоз. Структура, кількісні та якісні ознаки. – К.: Вид-во НАУ, 2003. – 95 с.
- Григора І.М., Соломаха В.А. Рослинність України. – К.: Фітосоціоцентр, 2005. – 451 с.
- Якубенко Б. Є., Попович С. Ю., Устименко П. М., Дубина Д. В., Чурілов А. М. Геоботаніка: методичні аспекти вивчення. – К., 2018. – 379 с.

11. Злобин Ю.А. Популяционная экология растений: современное состояние, точки роста. - Сумы: Унив. книга, 2009 - 263 с.
12. Коваленко І.М. Лісова екологія з основами лісовідновлення та лісорозведення. Підручник. — Суми: Сумський національний аграрний університет, Університетська книга, 2018. — 240 с.

Other sources

13. Алексеев. Е.В. Типы Украинского леса Правобережье. – К.: Книгоспілка, 1928.-120 с.
14. Злобин Ю. А. Популяции редких видов растений: теоретические основы и методика изучения / Ю. А. Злобин, В. Г. Скляр, А. А. Клименко. – Сумы: Унив. книга, 2013. – 439 с.
15. Якубенко Б.Є., Попович С.Ю., Григорюк І.П., Мельничук М.Д. Геоботаніка: тлумачний словник. – К.: Фітосоціоцентр, 2011. – 420 с.
16. Коваленко І. М. Екологія нижніх ярусів лісових екосистем: монографія / І. М. Коваленко – Суми: Університетська книга, 2015 – 360 с.

Information resources

- ✓ Державне агентство лісових ресурсів України - <http://dklg.kmu.gov.ua/forest/control/uk/index>
- ✓ Український геоботанічний сайт – <http://geobot.org.ua/>
- ✓ The International Association for Vegetation Science (IAVS) - <http://iavs.org/PlantaEuropa> – <https://www.plantaeuropa.net/>
- ✓ European Vegetation Archive (EVA) – <http://euroveg.org/eva-database>
- ✓ International plantname index (IPNI) – <http://www.ipni.org/>
- ✓ Leibniz Universitätsgesellschaft Hannover. V. – Sektion Institut für
- ✓ Geobotanik (сайт Інституту геоботаніки, Німеччина) – <https://www.geobotanik.uni-hannover.de/was.html?&L=1>

Academic Program (Syllabus) Review

FOREST ECOLOGY

Parameter by which the educational program (syllabus) of the educational component is assessed by the guarantor or a member of the project team	Yes	No	Comment
Learning outcomes according the educational component (MLOs) correspond to the NQF	+		
Learning outcomes according the educational component (MLOs) correspond to the stipulated PLOs (for compulsory EC)	+		
The results of training in the educational component provide an opportunity to measure and assess the level of their achievement	+		

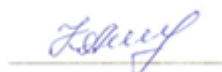
Member of the project group Ecology Academic Program



V.G. Skliar

Parameter by which the educational program (syllabus) of the educational component is assessed by the teacher of the relevant department	Yes	No	Comment
General information about the educational component is sufficient	+		
Learning outcomes for the educational component (MLOs) correspond to the NQF The list of training resources contains the necessary software products to achieve DRN	+		
Learning outcomes for the educational component (MLOs) provide an opportunity to measure and assess the level of their achievement	+		
Learning outcomes (MLOs) relate to the students competencies, not the content of the discipline (contain knowledge, skills, abilities, not topics of the curriculum of the discipline)	+		
The content of the EC is formed in accordance with the structural and logical scheme	+		
Learning activity (teaching and learning methods) allows students to achieve expected learning outcomes (MLOs)	+		
The educational component involves learning through research that is appropriate and sufficient for the corresponding level of higher education	+		
The assessment strategy within the educational component is in line with the policy of the University / faculty	+		
The provided assessment methods allow to assess the degree of achievement of learning outcomes in the educational component	+		
The workload of students is adequate to the volume of the educational component	+		
Recommended learning resources are sufficient to achieve learning outcomes (MLOs)	+		
The literature is relevant	+		
The list of training resources contains the necessary software products to achieve MLOs	+		

Reviewer



G.O. Klymenko