	SYLLABUS **«Agroforestry systems, practices, technologies»** **Higher education degree – Master** **Specialty 205 Forestry** **Year of study ___1___, semester___2___** **Form of study _____full-time_____** **Number of ECTS credits _____5.0_____** **Teaching language __ English_**
Lecturer of the Module №1 Contact information of the lecturer (e-mail)	Professor of Forest Restoration and Meliorations, Dr. Vasyl Y. Yukhnovskyi yukhnov@nubip.edu.ua yukhnov@ukr.net
Lecturer of the Module №2 Contact information of the lecturer (e-mail)	Associate Professor of Forest Restoration and Meliorations, PhD Oleksandr V. Sovakov sovakov@nubip.edu.ua sovakov_o@ukr.net
Lecturer of the Module №3 Contact information of the lecturer (e-mail)	Associate Professor of Forest Restoration and Meliorations, PhD Ganna Lobchenko lobchenko@nubip.edu.ua
Course page in eLearn	https://elearn.nubip.edu.ua/course/view.php?id=4321

Description of the course

The aim of the discipline "Agroforestry systems, practices, technologies" is to study the impact of woody plant species on improving soil conditions and environment, increasing the agto-landscapes by creating different types of agroforestry plantations, their spatial location in agro-landscapes and urban landscapes and management of agroforestry landscapes.

The subject of the discipline "Agroforestry systems, practices, technologies" is a system of general principles and approaches related to scientific and practical activities in the field of agroforestry, forestry and urban ecology, landscape science.

The objectives of the discipline are: acquisition of skills to apply the theoretical knowledge obtained in the learning process on agroforestry, phytomelioration, urban ecology; gaining experience in the ability to substantiate agroforestry approaches to the design and creation of agroforestry plantations, optimization of the ecological component of rural landscapes.

The discipline ensures the formation of a number of **competencies**:

Integrated competency (IC):

Ability to solve complex tasks and problems in the field of agroforestry in the process of learning, which involves conducting research or implementing innovations and is characterized by uncertainty of conditions and requirements.

General competences (GC)

GC 7. Ability to work in an international context.

Special (professional, subject) competences (SC)

SC 3. The ability to evaluate regional peculiarities of natural and climatic conditions for the organization of effective agroforestry, the performance of various functions by forests and the increase of forest areas.

SC 5. Ability to integrate knowledge and solve complex forestry problems in broad or multidisciplinary contexts

Program learning outcomes (PLO):

PLO 1. Specialized conceptual knowledge, which includes modern scientific achievements in the field of agroforestry and is the basis for original thinking, ensuring sustainable development and conducting research.

PLO 2. Communicate freely orally and in writing in Ukrainian and foreign languages when discussing professional issues, research and innovations in the field of forestry.

PLO 4. Search for necessary data in scientific literature, databases and other sources, analyze and evaluate these data;

PLO 7. Develop and implement scientific and applied projects in the field of forestry, taking into account available resources and risks, as well as economic, legal and environmental aspects.

PLO 11. Apply modern experimental and mathematical methods, digital technologies and specialized software to solve complex problems of forestry and hunting.

PLO 12. Conduct research and/or conduct innovative activities in order to obtain new knowledge and create new technologies and products in forestry and hunting and in wider multidisciplinary contexts.

Course structure

Names of content modules and topics	Number of hours												
	Full-time form							Part-time form					
	weeks	total	including					total	including				
			l	*p*	*lab*	*ind*	*self*		*l*	*p*	*lab*	*ind*	*self*
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content Module 1. Structure, anthropogenic impacts and monitoring of agroforestry landscape													
Topic 1. Agroforestry is a key element of land use	1-2	14	2	2			10	-	-	-	-	-	-
Topic 2. Structure of agroforestry landscape and anthropogenic impacts	3-4	23	4	4			15	-	-	-	-	-	-
Topic 3. Agroforestry monitoring	5	17	2	-			15	-	-	-	-	-	-
Total for content module 1	54		**8**	**6**			**40**	-	-	-	-	-	-
Content Module № 2. Aboveground and Belowground Interactions in Tree-Crop Agroforestry													
Topic 4. Differentiation of the territory according to erosion processes	6	16	2	4			10	-	-	-	-	-	-
Topic 5. Methods of conducting research on wind speed and snow accumulation in field protective forest plantations	7-8	19	2	2			15	-	-	-	-	-	-
Topic 6. Methods of planning and analyzing soil research in field protective forest plantations	9-10	14	2	2			10	-	-	-	-	-	-
Total for content module 2	49		**6**	**8**			**35**	-	-	-	-	-	-
Content Module № 3. *Agroforestry and the Global Goals*													
Topic 7. Agroforestry for ecosystem services and environmental benefits	11-12	21	2	4	-		15		-	-	-	-	-

Topic 8. Social and economic implications of agroforestry for rural economic development	13-14	14	2	2			10					
Topic 9. Agroforestry practices implementation in Ukraine: current state, policy, challenges and prospective	15	12	2	-			10					
Total for content module 2		47	6	6			35		-	-	-	-
Total hours		**150**	**20**	**20**			**110**		-	-	-	-

Evaluation policy

Deadline and retaking policy	The work done correctly and completed during the classroom is exempt from oral defence. Works that are submitted in violation of deadlines without good reason are evaluated with a lower grade in accordance with the evaluation criteria. Rearrangement of modules takes place with the permission of the lecturer if there are good reasons (for example, hospital).
Academic Integrity Policy:	Write-offs during tests and tests are prohibited (including the use of mobile devices and other gadgets). Presentations must have correct references to the literature used.
Attendance Policy:	Attendance is mandatory. For objective reasons (for example, illness, participation in scientific and technical activities, international internship) training can take place individually (in online form in consultation with the Director of the Institute)

Student assessment scale

Rating of higher education seekers, score	Correlations between national estimates and ECTS grades
90-100	excellent / відмінно
74-89	good / добре
60-73	satisfactory / задовільно
0-59	unsatisfactory / незадовільно

Recommended sources of information

1. Burgess PJ, Rosati A (2018) Advances in European agroforestry: results from the AGFORWARD project. Afor Syst 92:801–810. https://doi.org/10.1007/s10457-018-0261-3

2. Douglas G., Walcroft A., Hurst S. et al. Interactions between widely spaced young poplars (Populus spp.) and introduced pasture mixtures. Agroforestry Systems. 66(2). 2006. 165-178.

3. Forest restoration and melioration in Ukraine: origins, current state, challenges of the present and prospects in the anthropocene. Collective monograph (to the 100th anniversary of the Department of Forests Restoration and Forest Meliorations). K. NULESU, 2019. 350 p.

4. Garrett H., Buck L., Gold M. et all. Agroforestry: An Integrated Land-Use Management System for Production and Farmland Conservation. Resource Conservation Act (RCA) Appraisal of U.S. Agroforestry USDA Natural Resources Conservation Service, 1994. 58 p.

5. Graves AR, Burgess PJ, Palma JHN, Herzog F, Moreno G, Bertomeu M, Dupraz C, Liagre F, Keesman K, van der Werf W, de Nooy AK, van den Briel JPP (2007) Development and application of bio-economic modelling to compare silvoarable, arable, and forestry systems in three European countries. Ecol Eng 29:434–449. https://doi.org/10.1016/j.ecoleng.2006.09.018

6. Gruenewald H, Brandt BKV, Schneider BU, Bens O, Kendzia G, Hüttl RF (2007) Agroforestry systems for the production of woody biomass for energy transformation purposes. Ecol Eng 29:319–328. https://doi.org/10.1016/j.ecoleng.2006.09.012

7. Hasanuzzaman M. Classification of agroforestry systems – [Електронний ресурс], режим доступу: http://hasanuzzaman.webs.com/forstudents.htm.

8. Kuemmel B (2003) Theoretical investigation of the effects of field margin and hedges on crop yields. Agr Ecosyst Environ 95:387–392. https://doi.org/10.1016/S0167-8809(02)00086-5

9. Long AJ, Nair PKR (1999) Tree outside forests: agro-, community, and urban forestry. New Forests 17(1–3):135–174

10. Mosquera-Losada M-R., Pantera A., Rosati A., Amaral J., Smith J., Rigueiro-Rodn'guez A., Watte J., Dupraz C. What priorities for European Agroforestry? The First European agroforestry conference (Brussel, 9-10 October, 2012). 73.

11. Nuberg IK (1998) Effect of shelter on temperate crops: a review to define research for Australian conditions. Agrofor Syst Int J 41(1998):3–34

12. Palma JHN, Graves AR, Burgess PJ, van der Werf W, Herzog F (2007) Integrating environmental and economic performance to assess modern silvoarable agroforestry in Europe. Ecol Econ 63:759–767. https://doi.org/10.1016/j.ecolecon.2007.01.011

13. Reidsma P, Ewert F, Lansink AO, Leemans R (2010) Adaptation to climate change and climate variability in European agriculture: the importance of farm level responses. Eur J Agron 32:91–102. https://doi.org/10.1016/j.eja.2009.06.003

14. Reisner Y., de Filippi, Herzog F. et al. Target regions for silvoarable agroforestry in Europe. Ecological Engineering. 29(4). 2007. P. 401–418.

15. Rigueiro-Rodriguez A., VcAdam J., Vosquera-Losada MR. Agroforestry in Europe Current Status and Future Prospect. Springer. 2009.

16. Агролісомеліорація. Терміни і визначення понять : ДСТУ ISO 4874:2007. [Чинний від 01.01.2009]. К. Держспоживстандарт України, 2010. 18 с. (Національний стандарт України).

17. Гладун Г.Б., Юхновський В.Ю. Агролісівництво як організаційно-просторове, екологічне і економічне удосконалення землекористування в Україні. Матеріали міжн. наук.-практ. конф. «Освіта, наука та інновації у лісовому і садово-парковому господарстві України в контексті регіональних та глобальних викликів». К. НУБіП України, 2010. С. 141–142.

18. Гладун Г.Б., Юхновський В.Ю. Перспективи розвитку агролісівництва в Україні. Матеріали конференції науково-педагогічних працівників, наукових співробітників і аспірантів та 63-ї студентської наукової конференції. К. НУБіП України. 2009. С. 130–132.

19. Лісові меліорації: підручник / [Пилипенко О.І., Юхновський В.Ю., Дударець С.М, Малюга В.М.] ; за ред. В.Ю. Юхновського. – К. : Аграрна освіта, 2010. – 282 с.

20. European agroforestry federation [Electronic resource] www.agforward.eu .

21. Pan-European Biological and Landscape Diversity Strategy and Landscape Strategy. http://www.unep.org/roe/PromotingBiodiversityConservation/tabid/54597/Default.aspx.

22. AFTA (Association for Temperate Agroforestry) Definitions. [Electronic resource] http://www.agroforestry.ac.uk/systems/index.hmtl.

23. Food Agricultural Organization [Electronic resource] http://www.fao.org.

24. The Law of Ukraine "On Land Development" of January,14, 2000. Number 1389-XIV // Governmental Courier. - 2000. - № 29. - P. 3-10.

25. The Concept of Agroforestry in Ukraine [approved by the Cabinet of Ministers of Ukraine of September, 18, 2013. № 725-р].

26. Правила утримання та збереження полезахисних лісових смуг, розташованих на землях сільськогосподарського призначення (Постанова Кабінету Міністрів України від 22 липня 2020 р. № 650) Режим доступу: https://zakon.rada.gov.ua/laws/show/650-2020-%D0%BF#Text.