EC 10-VII Ecophysiology of Plants and Microorganisms

Code	EC 10-VII
ECTS credits	4
Attendance time	8 Semester
Language of instruction	Ukrainian
Duration	1
Cycle	Each Summer Semester
Coordinator	Associate Professor, PhD, Yukhno Yuliya Associate Professor, PhD, Vinnikova Olga
Instructor(s)	Associate Professor, PhD, Yukhno Yuliya Associate Professor, PhD, Vinnikova Olga
Allocation of study programmes	Biology
Recommended prerequisites	Structural Botany: Anatomy of Plants; Biochemistry; Botany; Microbiology; Ecology; Plant Physiology and Biochemistry.
Learning objectives	The course deals with the basic problems of ecology of plants and microorganisms. - Knowledge of the microorganism and environmental factors effect on the plant organism and mechanisms of their adaptation to existence; - Knowledge of basic ecological groups of plants, physiological groups of microorganisms and skills to a comprehensive approach to their study; - Knowledge of the most common of classic and modern research methods and stress resistance of plants to unfavorable environmental factors;

	- Knowledge of methods used to study the activity of microorganisms in nature; - Ability to apply theoretical knowledge on plant ecology and ecology of microorganisms in biological and microbiological activities
Syllabus	Chapter 1. Ecological Plant Physiology. Topic 1. Plant Ecology: subject, tasks, basic concepts. classification and laws of action of environmental factors. Topic 2. Abiotic factors, their role and influence on plants. Ways of adaptation of plants to the action of abiotic factors. Topic 3. Biotic factors and their role in the functioning of phytocenoses. Life forms of plants and periodic phenomena in plant life. Topic 4. Anthropogenic factors and artificial phytocenoses. Chapter 2. Plant Ecophysiology and Modern Problems of Global Ecology. Topic 5. Environmentological function of plants. Topic 6. World Development and plant ecology. Chapter 3. Ecosystem and its components, factors influencing the ecosystem and the composition of microbiocenoses. Topic 7. The subject and main tasks of the ecology of microorganisms. Influence of environmental factors on the composition of microbiocenoses Topic 8. Interspecific relationships of microorganisms. Microbial community. Topic 9. Microbial ecosystems, microorganisms in the biosphere. Chapter 4. Microorganisms as constituents of different types of ecosystems. Topic 10. Microbial ecosystems of the atmosphere. Microbial ecosystems of the lithosphere.

	Topic 11. Microbial ecosystems of the hydrosphere. Other global ecological niches. Chapter 5. Ecology of viruses. Topic 12. Viruses outside the host organism
Literature	1. Musiyenko M.M. Plant Ecology. – Kyiv: Lybid, 2006. – 432 p. 2. Nduka Okafor Environmental Microbiology of Aquatic and Waste Systems. Springer Science Business Media B.V. 2011/ 3. Nobel P. Physicochemical and Environmental Plant Physiology. 5th Ed. Academic Press. 2020. 676 p. 4. Shabala S. Plant stress physiology. 2nd Ed. University of Tasmania, Australia. 2017. 376 p. 5. Singh V. Environmental plant physiology : botanical strategies for a climate smart planet. Boca Raton, FL : CRC Press, 2020. Soil microbiology, ecology, and biochemistry / editor, Eldor A. Paul. — 3rd ed. p.
Teaching and learning methods	Lecture (2 WH), Laboratory (1 WH)
Workload	Classroom hours: 30 h Laboratory hours: 15 h Individual study time/preparation and postprocessing: 75 h **Total: 120 h**
Assessment	The assessment consists of written examination and preliminary graded study achievements
Grading procedure	The module grade is the sum of preliminary study achievements and the examination grade
Basis for	• Plant Physiology and Biochemistry • Methods of Biochemical Analysis of Plants • Isolation and Identification of Microorganisms

	Basic Methods of Sanitary, Soil and Water Microbiology