EC 09-VII Intracellular Signaling Systems and Mechanisms of Adaptation of Plants and Microorganisms

Code	EC 09-VII
ECTS credits	4
Attendance time	8 Semester
Language of instruction	Ukrainian
Duration	1
Cycle	Each Summer Semester
Coordinator	Associate Professor, PhD, Yukhno Yuliya
Instructor(s)	Associate Professor, PhD, Yukhno Yuliya
Allocation of study programmes	Biology
Recommended prerequisites	Cell biology; Structural Botany: Anatomy of Plants Chemistry; Molecular Biology; Microbiology;; Plant Physiology and Biochemistry.
Learning objectives	- knowledge of the nature of the reception and transmission of intracellular signals; - knowledge of the structure, methods of activation and operation of signaling intermediaries; - knowledge of examples of reconstructed signaling mechanisms; - the ability to predict the peculiarities of signaling mechanisms in conditions of presence of mutations in certain signal components and considering this to plan experiments.
Syllabus	Chapter 1. Principles of functioning of intracellular signaling mechanisms Topic 1. The phenomenon of signal transduction in the cell.

	Topic 2. Structure and properties of signaling mechanisms. Chapter 2. Reception of signals. Topic 3. Ligand-binding receptors. Topic 4. Reception of an external signal by the cell. Chapter 3. Signal transmission within the cell. Topic 5. G-proteins. Topic 6. Effector molecules and secondary messengers. Topic 7. Ca2+ ions in the signal transduction system. Topic 8. Mechanisms of Plant Hormone Signaling. Chapter 4. Adaptation mechanisms. Topic 9. Non-specific mechanisms of plant adaptation. Topic 10. Specific mechanisms of plant adaptation.
Literature	1, Dzhamieev V.Y. Mechanisms of reception and intracellular signaling in plants: a textbook. Kh.: V.N. Karazin Kharkiv National University, 2016. – 208 p. 2. Kolupaev Y.E. Fundamentals of Plant Resilience Physiology. Kh., 2010. -122 p. 3, Hormone Metabolism and Signaling in Plants / Editor(s): Jiayang Li, Chuanyou Li, Steven M. Smith . Academic Press. 2017. 597 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