OC 26 Biotechnology

Code	OC 26
ECTS credits	3
Attendance time	4 Semester
Language of instruction	Ukrainian
Duration	1
Cycle	Each Summer Semester
Coordinator	Associate professor, PhD Olha Avksentieva
Instructor(s)	
Allocation of study programmes	Biology
Recommended prerequisites	Cell biology; Biochemistry; Genetic; Molecular biology; Microbiology; Ecology and knowledge of the disciplines of natural science
Learning objectives	- Students' acquisition of theoretical knowledge regarding the level of scientific achievements in the field of general biotechnology, industrial microbiology, modern phyto-biotechnologies, animal biotechnology and ecobiotechnologies; - basic information about the general stages of biotechnological production, - plant and animal cell cultures, - existing industrial processes of microbial synthesis of target products, - plant and animal cloning technologies, - the basics of transgenesis, - as well as the basics of biosafety and bioethics for use in biotechnological research.
Syllabus	**Topic 1. Biotechnology as a science, directions of development, basic concepts** - stages of development of biotechnology as a science, main directions of development - characteristics of objects and methods of modern biotechnology - general principles of biotechnological processes. **Topic 2. Industrial microbiology:** - microbiological process - the characteristics of microorganisms-producer

	microbial synthesis of low molecular compounds use of enzymes and enzyme preparations food biotechnology using alcoholic fermentation **Topic 3. Phytobiotechnologies:** types of in vitro cultures callus culture suspension culture biotechnologies based on the culture of cells, tissues and organs of higher plants microclonal plant propagation **Topic 4. Biotechnology of animals:** cultures of animal cells stem cells animal cloning transgenic animal organisms problems of bioethics and biosafety in biotechnological research **pic 5. Ecological biotechnology:** ogy of water purification tion of xenobiotics diation rs and biopesticides cs - biofuel and biogas production
Literature	dbey W.T. An Introduction to Biotechnology. The Science, Technology and edical Applications. - Academic Press, 2014. – 436 p. ark D., Pazdernik N. Biotechnology. 2nd Edition. - Academic Cell, 2015. – 5 p. Avksentieva O.O., Chumakova V.V. Biotechnology of vascular plants: culture in vitro. Educational and methodological manual. Kind. the second - Kh.: KhNU named V.N. Karazin, 2021. – 88 p. Kot Y., Kot K., Perskyi E. Cell technologies. Technologies of cell cultivation in vitro. Educational and methodological manual. – Kh.: KhNU named after V.N. Karazina, 2022. – 141 p. Melnychuk M.D., Novak T.V., Kunakh V.A. Biotechnology of plants. - K.: Higher education, 2003.-520 p.

	Pidhorsky V.S., Iutynska G.O., Pyrog T.P. Intensification of microbial synthesis technologies. - Kyiv: Naukova dumka, 2010. - 327 p.
Teaching and learning methods	Lecture (2 WH), Laboratory (1 WH)
Workload	Classroom hours: 45 h Individual study time: 45 h Total: 90 h
Assessment	The assessment consists of a written credit work and a preliminary assessment of educational achievements
Grading procedure	The module grade is the sum of preliminary study achievements and the credit work grade
Basis for	Genetics, Molecular Biology; Elective courses and Course project