
EC 13-VII Isolation and Identification of Microorganisms

Code	EC 13-VII
ECTS credits	4
Attendance time	7th Semester
Language of instruction	Ukrainian
Duration	1
Cycle	Each Autumn Semester
Coordinator	Lectures, Iryna Rayevska
Instructor(s)	Lectures, Iryna Rayevska
Allocation of study programmes	Biology
Recommended prerequisites	Ecology of microorganisms, Sanitary microbiology, Laboratory research methods
Learning objectives	Methods of sterilizing dishes and equipment, making nutrient media for microbiological analyses, preparation of nutrient media, growth factors, methods of obtaining stock cultures, methods of cultivating different groups of microorganisms, methods of isolating a pure culture, methods of checking the culture of microorganisms for purity, methods of identifying an unknown culture, working with electronic determinant of microorganism and Bergey's manual of systematic bacteriology.
Syllabus	Work in a microbiological laboratory. <u>Rules of work in a microbiological laboratory.</u> Rules of work and safety equipment in the laboratory. Instructions on the sanitary and epidemiological regime in the laboratory. Normative documents in microbiological practice. The order of storage, work, issuing of cultures of microorganisms of groups I-IV. Disinfectants. Methods of sterilization.

	<p><u>Production of nutrient media.</u> Preparation of solutions with percentage, molar and normal concentration. Calculation, preparation and sterilization of matrix solutions. Environmental requirements. Differential diagnostic environments. Setting the pH of media. Using buffers. Filtering, lighting, bottling and sterilization of media and individual components.</p> <p>Methods of obtaining accumulative and pure cultures and their identification.</p> <p><u>Cultivation of microorganisms of different groups.</u> Cultivation of aerobic, microaerophilic and anaerobic microorganisms. Acidity of the environment, temperature, lighting, humidity, etc. Biophysical, biochemical, biological methods of obtaining storage cultures. Obtaining accumulative cultures of lactobacilli and butyric acid bacteria.</p> <p><u>Obtaining pure cultures by various methods.</u> Obtaining pure cultures. Checking the culture for purity.</p> <p><u>Methods of identification of an unknown culture.</u> Cultural properties of microorganisms. Growth of bacteria on solid and liquid media. Morphological features of microorganisms. Physiological and biochemical properties of microorganisms. Identification scheme of an unknown culture. Principles of taxonomy of bacteria and the use of Bergey's manual of systematic bacteriology.</p> <p><u>Storage of microorganisms.</u> Methods of storage of microorganisms. Methods of activation and regeneration of cultures.</p>
Literature	<p>Benson H.J. Microbiological Applications A Laboratory Manual in General Microbiology, 8th edition. – 2002. – 496 p.</p> <p>Moselio Schaechter Deskencyclopedia of Microbiology, 2thedition. – USA: ElsevierInc, 2009. – 1259 p.</p> <p>Duncan F. MCB 1000L Applied Microbiology Laboratory Manual, 4thedition. – 2005. – 70 p.</p> <p>Cappuccino J. G., Sherman N. Microbiology: A Laboratory Manual, 5thedition. – 1999. – 471 p.</p>

	Da Silva N. et al. Microbiological Examination Methods of Food and Water: A Laboratory Manual/ 2nd Edition. — CRC Press, 2019. — 565 p. — ISBN 978-1-138-05711-1
Teaching and learning methods	Laboratory (6 WH)
Workload	Laboratory hours: 80 h Individual study time/preparation and postprocessing: 40 h Total: 120 h
Assessment	The assessment consists of written tests and oral interview
Grading procedure	The module grade is the sum of preliminary study achievements and the final test grade
Basis for	<ul style="list-style-type: none"> • Biology, Metabolism and Systematics of Microorganisms • Ecophysiology of Plants and Microorganisms • Quality Control and Standards of Biological Products • Basic Methods of Sanitary, Soil and Water Microbiology