

Course title: TECHNICAL MICROBIOLOGY

ECTS credit allocation (and other scores): 3

Semester: spring

Level of study: ISCED-7 - second-cycle programmes (EQF-7)

Branch of science: Agricultural sciences

Language: English

Number of hours per semester: 45

Course coordinator/ Department and e-mail: Magdalena Olszewska, PhD, Department of Industrial and Food Microbiology, magdalena.olszewska@uwm.edu.edu

Type of classes: classes and lectures

---

#### Substantive content

**CLASSES:** Morphological and physiological characteristics of microorganisms associated with food quality and safety. Environmental microbiological monitoring of the food processing environment. Effect of physical and chemical factors on growth and survival of microorganisms in the food processing context, including technological processes in terms of food quality and safety, hygienic practices on cleanliness of food processing environments. Bacterial biofilms and control by different biocides used in food processing facilities. Detecting the biofilm load on food contact surfaces with the use of rapid in situ technique.

**LECTURES:** Use and role of microorganisms in food processing. Morphology, metabolism, physiology and genetics of microorganisms and methods of their use in bioprocesses. Bacterial strains intended for industrial applications. Food fermentations, lactic acid bacteria, starter cultures, protective cultures, probiotic foods. Microbial contaminants and contamination routes in food processing facilities. Disinfectants, their composition, action and use. Microbial survival, adaptation and resistance to disinfectants. Biofilm formation, persistence and control in food processing plants.

**Learning purpose:** Providing knowledge of food-related microorganisms and responsibility for the hygiene in food processing plants.

---

On completion of the study programme the graduate will gain:

**Knowledge:** Defines and explains the terminology concerning microorganisms, the effect of microorganisms on food quality.

**Skills:** Plans and conducts the laboratory experiments with the use of analytical procedures relevant in food microbiology.

**Social Competencies:** Works in a group and adopt different roles with the sense of responsibility for own and team performance.

**Basic literature:** Series United States Department of Agriculture Food Safety and Inspection Service, Introduction to the Microbiology of Food Processing. Small Plant News Guidebook Series. USDA/FSIS, 2012

**Supplementary literature:** Chmielewski R.A.N., Frank J.F., Biofilm formation and control in food processing facilities, *Comprehensive Reviews in Food Science and Food Safety*, 2003, t. 2, s. 22-32. Olszewska M., Microscopic findings for the study of biofilms in food environments, *Acta Biochimica Polonica*, 2013, t. 60, s. 531–537. Students choice, Based on own selection or supervisor advice, Elsevier, Wiley, etc., 2008-2018

---



The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 47h

Student's independent work: 28h