VELEUČILIŠTE U KARLOVCU
Karlovac University of Applied Sciences

SYLLABUS PREDMETA

General information

Course title:	Fundamentals of Microbiology
ISVU[1] course code:	3829
Studies in which the course is taught:	Food Technology
Course Instructor:	Bojan Matijević, Ph. D., College Professor
Course Assistant:	-
ECTS credits:	5.0
Semester of the course execution:	III
Academic year:	
Exam prerequisites:	-
Lectures are given in a foreign language:	-
Aims:	Introduce the student to the fundamental microbiology and the microbiology of food of plant and animal origin. Also, one of the aims of the course is to introduce the student to microbes and their role in all spheres of micro and macro life.

Course

Course structure	Number of contact hours per week:	Number of contact hours per semester:	Student's requirements by type of teaching:
Lectures:	2	30	Lecture attendence 80%
Tutorials:			
Practical (lab) sessions:	2	30	Exercises attendance 80%
Seminars:			
Field work:			
Other:			
TOTAL:	4	60	

Monitoring of students' work, knowledge evaluation and learning outcomes

	LEARNING OUTCOMES (upon completion of the course the student should be able to:)	**FACTORS AFFECTING THE GRADE** (e.g. term paper, practical work, presentation, ...)	**MAXIMUM NUMBER OF POINTS PER FACTOR**
Formation of the grade during the implementation of teaching: (Define from minimum 5 to maximum 10 learning outcomes)	Define the general characteristics of microorganisms and their role in nature and in human life	Colloquium I	
	Identify and define general properties of prokaryotic microorganisms and non-cellular entities and apply microscopic methods	Colloquium I	
	Identify and define general properties of eukaryotic microorganisms and apply microscopic methods cycles.	Colloquium I	
	Describe and distinguish between factors of growth, reproduction and dying.	Colloquium II	
	Describe microorganisms used in food production, cause spoilage and microbial growth suppression processes.	Colloquium II	

[1] ISVU – Information System of Higher Education Institutions in Croatia

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	Apply microbiological methods of isolation and identification of microorganisms and interpret results in microbiological control of food quality	Colloquium II	
Alternative formation of the grade (I 1 – I 10)	**or** alternative formation of the grade: 1 – 6 Final written exam = 50% of final grade - 1, 2, 3, 4, 5, 6 Oral exam = 50% of final grade - 1, 2, 3, 4, 5, 6		TOTAL: 100 points
Students' competencies	Students will acquire the general and professional competencies required to work in a microbiology laboratory. The student will be able to self-microscope, prepare and perform microbiological analysis. It will also be able to interpret the results of microbiological analyses.		

Prerequisites for course approval (lecturer's signature):	Attended lectures, completed lab work, correctly written papers
Prerequisites for taking exams:	Obtained signature
Grading scale:	(According to the Regulations on student assessment of Karlovac University of Applied Sciences, Article 9, Paragraph 5) 90-100 - excellent (5) (A) 80 to 89.9 - very good (4) (B) 65 to 79.9 - good (3) (C) 60 to 64.9 - sufficient (2) (D) 50 to 59.9 - sufficient (2) (E) 0 to 49.9 – fail (1) (F)

ECTS structure

ECTS credits allocated to the course reflect the total burden to the student during adoption of the course content. Total contact hours, relative gravity of the content, effort required for exam preparation, as well as, every other possible burden are taken in account:

Attendance (active participation)	**Term paper**	**Composition**	**Presentation**	**Continuous assessment and evaluation**	**Practical work**
1,5					**1,5**
Independent work	**Project**	**Written exam**	**Oral exam**	**Other**	
		1,0	**1,5**		

Review of topics/units per week associated with learning outcomes

Week	Lectures topics/units and learning outcomes:	Tutorials topics/units and learning outcomes:
1.	History and development of microbiology as a science	Microbiological laboratory and work organization
2.	Methods for studying microorganisms	Microscopic preparations and staining procedures: native preparation and method of hanging drops
3.	Prokaryotes: taxonomy and nomenclature, Fungi: morphology and systematics	Preparation and sterilization of laboratory equipment and nutrient medium for microbiological analysis
4.	Protists (Protista empire), viruses	Material for microbiological examination
5.	Microbial growth, cultivation and metabolism. The growth and propagation of bacteria.	Isolation of bacteria, sporogenic bacteria and bacterial microscopic methods

6.	Macromolecules, structures and their importance, microbial metabolism	Isolation of yeasts and yeast microscopic methods
7.	Microbial ecology and interaction	Determination of physiological differences of microorganisms ria
8.	Biogeochemical cycles	Determination of viable cell count, direct and indirect methods
9.	Control of microorganisms growth	Microbiological indicators of hygienic quality
10.	Microorganisms in food	Bacteriological cleanliness of substrates, work surfaces, food holding containers
11.	Molds: morphology and systematics	Microbiological analysis of water
12.	Molds: morphology and systematics	Detection of microorganism contaminants in food
13.	Yeasts: morphology and systematics	Determining the cleanliness of the work surface by bioluminescence, determining the yeast viable cell count - NucleoCounter
14.	Methods for determination of bacterial growth	Detection of microorganism contaminants in food using PCR method
15.	Methods for determining the growth of yeasts and molds	Work of the authorized laboratory for microbiological control of food

References

REFERENCES (compulsory/additional):

1. Antolović, R., Frece, J., Gobin, I., Hrenović, J., Kos, B., Markov, K., Mlinarić-Missoni, E., Novak, J., Ožanič, M., Pinter, Lj., Plečko, V., Pleško, S., Šantić, M., Šegvić Klarić, M., Šeruga Musić, M., Škorić, D., Šušković, J. (2016): Priručnik za vježbe iz opće mikrobiologije, Hajsig, D., Delaš, F. (ur.).Hrvatsko mikrobiološko društvo, Zagreb.
2. Duraković S., Redžepović S. (2003): Uvod u opću mikrobiologiju - knjiga prva, Kugler d.o.o., Zagreb.
3. Duraković, S., Duraković, L. (2000): Specijalna mikrobiologija, Durieux, Zagreb.
4. Duraković, S., Duraković, L. (2001): Mikrobiologija namirnica: osnove i dostignuća, Kugler, Zagreb.
5. Duraković, S., Duraković, L. (2003): Mikologija u biotehnologiji, Kugler, Zagreb
6. Ray, B., Bhunia, A. (2014): Fundamental Food Microbiology, 5. izd., CRC Press, Boca Raton.
7. Tomar, S.K. (2017): Fundamentals of Microbiology, Dairy Mircobiology Division NDRI, Karnal.

Exams for the academic year: 2022/2023

Exam dates:	According to the schedule of exams for academic year

Contact information

1. Course Instructor/Lecturer:	Bojan Matijević, Ph. D., College Professor
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2. Course Instructor/Lecturer:	
e-mail:	
Office hours / Consultations:	