

NAME OF THE COURSE		FOOD PATHOGENS				
Code	PMB542	Year of study	1.			
Course teacher	Assoc. Prof. Ana Maravić	Credits (ECTS)	3			
Associate teachers	Dr. Tomislav Rončević	Type of instruction (number of hours)	L	S	E	F
			15	15		
Status of the course	Elective	Percentage of application of e-learning	50%			
COURSE DESCRIPTION						
Course objectives	The aim of the course is to provide students with basic knowledge about the clinically most important microorganisms that cause diseases transmitted by contaminated food and water. The aim is to acquaint students with the latest knowledge on the frequency of diseases associated with contaminated food on a global and national level and to point out the importance of compliance with food safety legislation.					
Course enrolment requirements and entry competences required for the course	None.					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>After taking the course, students will be able to:</p> <ul style="list-style-type: none"> - define the concept of microbiological food safety; - identify the most significant pathogenic foodborne pathogens from groups of viruses, bacteria, parasites and toxicogenic molds; - define microbiological indicators of food safety; - understand the risks leading to spoilage and / or food poisoning; - discuss food safety legislation. 					
Course content broken down in detail by weekly class schedule (syllabus)	<p><u>Lectures:</u></p> <p>Lecture 1: History and significance of food microbiology. Pathogenic microorganisms in food: sources, frequency and public health significance. (2 hours)</p> <p>Lecture 2: Microbiological indicators of food safety and microbiological food safety. Sensory, microbiological and chemical indicators of food spoilage. Food safety: HACCP (Hazard Analysis and Critical Control Points), GMP (Good Manufacturing Practice), GHP (Good Hygiene Practice). (2 hours)</p> <p>3. Gram-positive bacteria in food. (<i>Staphylococcus aureus</i>, <i>Listeria monocytogenes</i>, <i>Clostridium botulinum</i>, <i>C. perfringens</i>, <i>Bacillus cereus</i>, <i>B. anthracis</i>). (2 hours)</p> <p>Lecture 4: Gram-negative bacteria in food. <i>Salmonella</i>, <i>Shigella</i>, <i>Escherichia coli</i>, <i>Yersinia enterocolitica</i>, <i>Cronobacter sakazakii</i>. (2 hours)</p> <p>Lecture 5: Yeasts and molds - mycotoxins in food. Toxicogenic molds and major groups of mycotoxins in food. (2 hours)</p> <p>Lecture 6: Viruses in food. Noroviruses, hepatitis virus A, hepatitis virus E, rotavirus, enteroviruses. Prions: A new variant of Creutzfeldt-Jakob disease. (2 hours)</p>					

	<p>Lecture 7: Parasites in food. <i>Cryptosporidium</i> spp., <i>Toxoplasma gondii</i>, <i>Giardia lamblia</i>, <i>Trichinella spiralis</i>, <i>Taenia</i> spp. (1 hour)</p> <p>Lecture 8: Mechanisms of control of microorganisms in food. Control of access of food microorganisms. Physical removal control. Heat control. Low temperature control. Low pH and organic acids control. Altered atmosphere control. Antimicrobial preservative control. Radiation control. (2 hours)</p> <p>The seminars (15 hours) will cover current topics related to the content of the course.</p>																	
Format of instruction	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> <i>on line</i> in entirety <input checked="" type="checkbox"/> partial e-learning <input type="checkbox"/> field work			<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)														
Student responsibilities	Attendance of lectures in the amount of at least 70% of the scheduled hourly rate.																	
Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1	Research		Practical training													
	Experimental work		Report	1	(Other)													
	Essay		Seminar essay		(Other)													
	Tests		Oral exam		(Other)													
	Written exam	1	Project		(Other)													
Grading and evaluating student work in class and at the final exam	<p>The overall grade of the course is the average grade of the seminar and written exam according to the point scale:</p> <table> <tr> <td>% test</td> <td>Grade</td> </tr> <tr> <td><60</td> <td>fail (1)</td> </tr> <tr> <td>60 -70</td> <td>sufficient (2)</td> </tr> <tr> <td>71-80</td> <td>good (3)</td> </tr> <tr> <td>81-90</td> <td>very good (4)</td> </tr> <tr> <td>91-100</td> <td>excellent (5)</td> </tr> </table>						% test	Grade	<60	fail (1)	60 -70	sufficient (2)	71-80	good (3)	81-90	very good (4)	91-100	excellent (5)
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Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media													
	Duraković S., Delaš F., Stilinović B., Duraković L.: Moderna mikrobiologija namirnica - knjiga prva. Sveučilišni udžbenik (ured. S. Duraković). Kugler d.o.o., Zagreb, 2002.			5														
	Duraković S., Delaš F., Duraković L.: Moderna mikrobiologija namirnica - knjiga druga. Sveučilišni udžbenik (ured. S. Duraković). Kugler d.o.o., Zagreb, 2002.			5														
Optional literature (at the time of submission of study programme proposal)	Power point slides, relevant scientific papers.																	

Quality assurance methods that ensure the acquisition of exit competences	<ul style="list-style-type: none">- Active participation in classes.- Students' surveys evaluating the course and the teacher.- Students' feedback during consultations.
Other (as the proposer wishes to add)	Student consultations with prior oral notice or by e-mail: amaravic@pmfst.hr