

SUBJECT DESCRIPTION

1. Information on the study programme

1.1 The institution of higher education	UNIVERSITY OF ORADEA
1.2 Faculty	FACULTY OF ENVIRONMENTAL PROTECTION
1.3 Department	FOOD PRODUCT ENGINEERING
1.4 Field of study	FOOD PRODUCT ENGINEERING
1.5 Cycle of study	BACHELOR
1.6 Program of study/Qualification	PROCESSING TECHNOLOGY OF AGRICULTURAL PRODUCTS / ENGINEER

2. Information on the discipline

2.1 Name of discipline				SPECIAL MICROBIOLOGY				
2.2 Course holder				ASSOCIATE PROFESSOR PhD CAMELIA BARA				
2.3 Seminar/Laboratory/Project holder				LECTURER PhD IOANA VLAD				
2.4 Year of study	2	2.5 Semester	III	2.6 Type of evaluation	EX	2.7 Regimen of the subject	C	

(C) Compulsory; (O) Optional; (E) Elective

3. Total estimate time (hours per semester of didactic activities)

3.1 Number of hours per week	4	out of which: 3.2 course	2	out of which 3.3 laboratory	2
3.4 Total hours from the curriculum	56	Of which: 3.5 course	28	out of which 3.6 laboratory	28
Time allotment					69
Study assisted by manual, course support, bibliography and notes					20
Additional documentation in the library/ on specialised electronic platforms and in the field					20
Preparation of seminars/laboratories/ topics/reports, portfolios and essays					20
Tutorship					7
Examinations					2
Other activities.....					
3.7 Total hours of individual study	69				
3.9 Total hours per semester	125				
3.10 Number of credits	5				

4. Prerequisites (where appropriate)

4.1 curriculum	Knowledge of Organic Chemistry, Biochemistry, Cell Biology.
4.2 competences	Manipulation of biological samples in safe conditions for the user.

5. Conditions (where appropriate)

5.1. related to course	The course room equipped with video projector; internet connection.
5.2. related to laboratory	Laboratory equipment: optical microscope, sample homogenizer, pH meter, UV lamp, related equipment (autoclave machine, oven, laminar flux), specific utensils (inoculation loops, pipettes).

6. Specific competences acquired

Professional competences	C3.1 Establishing principles and methods of developing technical specifications based on acquired knowledge at the disciplines related to food equipment, industrial processes, transfer phenomena, operations and equipment. C5.1 . Identification of specialized terminology on the quality, standards and food hygiene in order to collaborate and cooperate with the authorities responsible for food safety and quality. C6.1 Identification of elementary concepts, theories, models and methods on the possibility of extending a production activity in the food industry.
Transversal competences	CT1 Applying strategies of perseverance, rigor, efficiency and accountability in the work, punctuality and accountability for the results of personal activities, creativity, common sense, analytical and critical thinking, problem solving, etc., based on the rules and principles of professional ethics code values in the food sector. CT2 Applying networking techniques within a team, enhancement and shaping of empathic capacities of interpersonal communication and ownership of some specific tasks in the group activity to treat / solve individual / group conflict, as well as the optimal management of time. CT3 Efficient use of various ways and learning/ training techniques to acquire the information from electronic and bibliographic databases both in Romanian and in an international language, as well as to evaluate the need and usefulness of extrinsic and intrinsic motivation of continuing education.

7. Objectives of discipline (coming from the specific competences acquired)

7.1 General objective	Acquiring information about the morphology and physiology of the main groups of microorganisms that can contaminate food products, the main relationships between the classes of microorganisms developing in food product, the knowledge of the laboratory techniques regarding the isolation and identification of microorganisms.
7.2 Specific objectives	Deepening knowledge of the presence and role of pathogenic microorganisms in food; the acquisition of techniques necessary for the isolation and identification of pathogenic germs polluting food; deepening knowledge for organizing, endowing and performing microbiological examinations; acquiring legislation on the isolation and identification of pathogens in food products.

8. Contents*

8.1 Course	Methods of teaching	No. of hours
Microbiological profile of the food. The sequence of microorganisms in food. Relationships between groups of microorganisms developed in food. Environmental factors that condition the multiplication of microorganisms in food.	Interactive conversation; video presentation; oral exposure.	2
Evolution of the development of microorganisms in food on the basis of their relationship to the characteristics of the food. Influence of chemical composition, anatomical structure and food pH on the multiplication of microorganisms. Organoleptic changes in food due to the development of microorganisms.	Interactive conversation; video presentation; oral exposure.	2
The main types of pathogenic microorganisms that contaminate food. Pathogenic bacteria that contaminate food. Viruses that contaminate food.	Interactive conversation; video presentation; oral exposure.	2

Parasites that contaminate food. Pathogenic molds that contaminate food. Pathogenic yeasts that contaminate food.		
Microbiological risks of food caused by pathogenic microorganisms during the technological process of processing it.	Interactive conversation; video presentation; oral exposure.	2
General characteristics of diseases due to the consumption of food contaminated by pathogenic microorganisms and ways of preventing their occurrence in processing factories and catering establishments.	Interactive conversation; video presentation; oral exposure.	2
The main types of fermentation initiated by microorganisms used in the food industry to manufacture compounds of practical importance.	Interactive conversation; video presentation; oral exposure.	2
Use of microorganisms in technologies for obtaining fermented foods using vegetal raw materials.	Interactive conversation; video presentation; oral exposure.	2
Use of microorganisms in the technological process of beer production.	Interactive conversation; video presentation; oral exposure.	2
Wine making technology by the spontaneous fermentation of grape musts initiated by microorganisms. Wine making technology by using selected microorganisms.	Interactive conversation; video presentation; oral exposure.	2
The use of microorganisms in the technology of manufacturing dairy products and cheeses.	Interactive conversation; video presentation; oral exposure.	2
Selected cultures of microorganisms for bread making technology.	Interactive conversation; video presentation; oral exposure.	2
Microbial collections for meat processing technology.	Interactive conversation; video presentation; oral exposure.	2
Animal origin food degradation caused by microorganisms.	Interactive conversation; video presentation; oral exposure.	2
Vegetable food degradation caused by microorganisms.	Interactive conversation; video presentation; oral exposure.	2
Bibliography Apostu Sorin, <i>Food Microbiology</i> , vol. I, Cluj-Napoca, Risoprint Publishing House, 2006. Apostu Sorin, <i>Food Microbiology</i> , vol. II, Cluj-Napoca, Risoprint Publishing House, 2006. Bara Camelia, <i>General Microbiology</i> , Oradea, Oradea University Press, 2009. Bara Camelia, <i>General microbiology of agrifood units</i> , Oradea, Oradea University Press, 2010.		
8.2 Seminary	-	-
8.3 Laboratory	Methods of teaching	No. of hours
Starter cultures of microorganisms -general notions, classification.	Presentation, description, observation, demonstration, directed learning.	2
Cultures of microorganisms used in the wine industry.	Presentation, description, observation, demonstration, directed learning.	2
Cultures of microorganisms used in the milk industry.	Presentation, description, observation, demonstration, directed learning.	2

Cultures of microorganisms used in the meat industry.	Presentation, description, observation, demonstration, directed learning.	2
Cultures of microorganisms used in the brewing industry.	Presentation, description, observation, demonstration, directed learning.	2
Cultures of starter microorganisms used in the bread and bakery industry.	Presentation, description, observation, demonstration, directed learning.	2
Cultures of microorganisms used to obtain probiotics.	Presentation, description, observation, demonstration, directed learning.	2
Culture media necessary for the development of microorganisms in microbiological laboratories of food industry.	Presentation, description, observation, demonstration, directed learning.	2
Techniques for the determination of microorganisms on working surfaces, machinery and food processing equipment of food industry.	Presentation, description, observation, demonstration, directed learning.	2
Microbiological analysis of milk processing equipments.	Presentation, description, observation, demonstration, directed learning.	2
Bottling plants wine microbiological contamination.	Presentation, description, observation, demonstration, directed learning.	2
Microbiological control of packaging materials used in food processing industry.	Presentation, description, observation, demonstration, directed learning.	2
Air microbiology quality control in food industry.	Presentation, description, observation, demonstration, directed learning.	2
Measures implemented in food industry to reduce contamination risks during processing.	Presentation, description, observation, demonstration, directed learning.	2
Bibliography Bara Camelia, <i>Practical work of microbiology</i> , Oradea, Oradea University Press, 2009. Bara, V., Chipurici, M., Zabik, A., Bara C., Nechita Derevenco, R., Paul, G., Bonta, M., <i>General methods of practical microbiology</i> , Oradea, Oradea University Press, 2000. Bara Vasile, Bara Camelia, Pop Constantin, <i>Applied microbiology techniques</i> , Oradea, Oradea University Press, 1998.		

* The content, respectively the number of hours allocated to each course / seminar / laboratory / project will be detailed during the 14 weeks of each semester of the academic year.

9. Corroboration of discipline content with the expectations of the epistemic community, professional associations and representative employers from the field corresponding to the study programme

Knowledge of the impact of microorganisms on food and consumer health. Apply basic methods to solve specific issues or situations specific to the food industry.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the final grade
10.4 Course	- for grade 5 - 50% knowledge of the subject for grade 6 - 60% knowledge of the subject	Summative assessment - exam - written or oral test	70%

	for grade 7 - 70% knowledge of the Summative assessment - exam - written or oral test 70% subject for grade 8 - 80% knowledge of the subject for grade 9 - 90% knowledge of the subject for grade 10 - knowledge of the subject in proportion of 100% (the student proves the consultation of the presented bibliographic material).		
10.5 Seminary			
10.6 Laboratory	for grade 5 - the student answers 50% of the questions correctly for grade 6 - the student answers 60% of the questions correctly for grade 7 - the student answers 70% of the questions correctly for grade 8 - the student answers 80% of the questions correctly for grade 9 - the student answers 90% of the questions correctly for grade 10 - the student answers 100% of the questions correctly	Practical evaluation	30%
10.7 Project			
10.8 Minimum standard of performance			
Execution of specific operations in the sphere of production according to the job description by complying with the rules of professional ethics and values. Making a portfolio by identifying and describing professional roles within a subordinate team. Accomplishing a bibliographic study on the food theme.			

Date of completion Signature of course holder**

Signature of seminar
laboratory/project holder **

01.10.2023 Assoc.prof. PhD Camelia Bara
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Date of approval in the department

Signature of the Head of Department

01.10.2023

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Dean signature

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** - Name, first name, academic degree and contact details (e-mail, web page, etc)will be specified.

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