



**FOOD MICROBIOLOGY  
COURSE OUTLINE**

**GENERAL**

<b>SCHOOL</b>	AGRICULTURAL SCIENCES		
<b>DEPARTMENT</b>	FOOD SCIENCE AND NUTRITION		
<b>COURSE LEVEL</b>	<i>Undergraduate</i>		
<b>COURSE CODE</b>	MK513	<b>SEMESTER</b>	5 <sup>th</sup>
<b>COURSE TITLE</b>	FOOD MICROBIOLOGY RESPONSIBLE: I. GIAVASIS		
<b>INDEPENDENT TEACHING ACTIVITIES</b>		<b>WEEKLY TEACHING HOURS</b>	<b>ECTS</b>
	<b>Lectures</b>	3	6
	<b>Lab Lectures-exercises</b>	3	
<b>COURSE TYPE</b> <i>Background, General Knowledge, Scientific Area, Skill Development</i>	<i>Scientific Area</i>		
<b>PREREQUISITES:</b>			
<b>LANGUAGE OF TEACHING AND EXAMINATIONS:</b>	GREEK		
<b>THE COURSE IS OFFERED TO ERASMUS STUDENTS</b>	YES		
<b>URL</b>	<a href="https://eclass.uth.gr/courses/FOOD_U_149/">https://eclass.uth.gr/courses/FOOD_U_149/</a>		

**TEACHING RESULTS**

<b>Teaching Results</b>
<p>Based on the knowledge of General Microbiology already acquired in the previous semester the Food Microbiology course is a core course of Food Science which introduces students to microbiology and microbiological analysis of foods, on the types of food microorganisms, their growth conditions and their control means or their destruction, while at the same time presenting in detail the microbiological alterations of food, the microbiological risks due to food pathogenic micro-organisms and products of their metabolism, and the beneficial actions of probiotic microorganisms or food fermenting microorganisms. The knowledge acquired is directly related to the food preservation and safety, nutrition and nutritional value of food and food quality and organoleptic control. The course material also aims to familiarize students with the use of various microbiological techniques for the enumeration of microorganisms for food and water or beverages.</p> <p>Upon successful completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Has knowledge of the basic laboratory techniques of Food Microbiology</li> <li>• Enumerates, isolates and identifies microorganisms found in food <ul style="list-style-type: none"> <li>• Knows which microorganisms are spoilage indicators and which are microbiological cause changes in food</li> <li>• Identifies spoilage microorganisms depending on the food and its processing of the potential microbiological hazards.</li> </ul> </li> <li>• Select appropriate processing, maintenance or disinfection/sanitization techniques to combat micro-organisms, depending on the composition and overall treatment of the food</li> <li>• estimate the shelf life of foods based on indicators of microbiological spoilage</li> <li>• Be aware of the risks to human health due to foodborne pathogens and the ways to prevent or</li> </ul>



deal with them.

- Know the types and the role of probiotic microorganisms in science and technology (fermented) foods

#### General Skills

- Search, analysis and synthesis of data and information, with use of necessary technologies
- Adaptation to new situations
- Decision making
- Autonomous work
- Group work
- Work in an interdisciplinary environment
- Generation of new research ideas
- Exercise criticism and self-criticism
- Promotion of free, creative and inductive thinking

#### CONTENT

##### LECTURES

###### 1st Week

Introduction to the basic concepts and the subject of Food Microbiology

###### 2nd Week

Main genera, species and categories of food microorganisms – Microbial Ecology and natural habitats of food microorganisms

###### 3rd Week

Factors affecting the growth of microorganisms in food

###### 4th Week

Effect of treatments and preservation methods on the microorganisms of food

###### 5th Week

Effect of disinfection and sanitization treatments on the microorganisms of food

###### 6th Week

Types and causes of microbiological spoilage of dairy products and responsible microorganisms

###### 7th Week

Types and causes of microbiological spoilage of meat, cured meats, fish, eggs and responsible microorganisms

###### 8th Week

Types and causes of microbiological spoilage of fruits and vegetables and those responsible microorganisms

###### 9th Week

Types and causes of microbiological spoilage of dry foods

###### 10th Week

Microbial indicators and food shelf life assessment

###### 11th Week

Foodborne Microbes and Foodborne Diseases – part A

###### 12th Week

Foodborne Microbes and Foodborne Diseases – part B

###### 13th Week

Probiotic microorganisms and their functions

##### LAB LECTURES-EXERCISES

1st Microbiological analysis of Total Mesophilic Flora and Psychrotrophs/Psychrophiles bacteria in food

2nd Enumeration of Gut Bacteria in Food

3rd Count of Yeasts-Fungi in food

4th Enumeration of Lactic Acid Bacteria in food and identification of lactic acid bacteria by biochemical, microscopic and other tests

5th Detection of *Salmonella spp* / *Listeria monocytogenes* in food

6th Enumeration of *Clostridium* / *Bacillus sporogenous* bacteria



**TEACHING AND LEARNING METHODS - EVALUATION**

<b>TEACHING METHOD.</b>	Face to face lectures in the auditorium/classroom and face to face laboratory exercises in an appropriate laboratory.		
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</b>	Use of e-class to communicate with students, posting announcements and educational materials, use MS-TEAMS platform in case of attendance need for distance education or examination		
<b>TEACHING STRUCTURE</b>	<b>Activity Semester</b>	<b>Workload</b>	
	Lectures	39	
	Lab Lectures	39	
	Literature Studing	32	
	Preparation for written examination	40	
	<b>Course Total: (25 hours of workload per credit unit)</b>	<b>150</b>	
<b>EVALUATION OF STUDENTS</b>	The evaluation language is Greek. The final grade of the course is formed by 70% of score of the theoretical part and by 30% of the laboratory courses. The exams for lectures part include multiple choice questions and developmental or critical questions. Laboratory exercises part exams include choice questions and exercises.		



## BIBLIOGRAPHY

### *Suggested Bibliography:*

- FOOD MICROBIOLOGY, KARL R. MATTHEWS, KALMIA E. KNIEL, THOMAS J. MONTVILLE [Details](#)
- Microbiology and Food Hygiene, Keweloh Heribert [Details](#)
- MICROBIOLOGY-MICROBIOLOGICAL ANALYSIS OF FOOD, KOTZEKIDOU-ROUKA P. [Details](#)
- Microbiology and Food Hygiene, Papadopoulou Chrysanthi [Details](#)
- Microbiology of food and digestive system, E. BEZIRTZOGLU [Details](#)
- FOOD MICROBIOLOGY, George Balatsouras [Details](#)
- FOOD MICROBIOLOGY, TIMPIS D., PETRAKIS E., KONDELES S. [Details](#)

### *Related scientific journals:*

- Food Microbiology
- International Journal of Food Microbiology
- Food Control
- Journal of Food Protection
- Microorganisms
- Fermentations
- Journal of Microbiology and Biotechnology
- Journal of Microbiology, Biotechnology and Food Sciences