Course Outline: "2102 - Food Microbiology"

1. General information

FACULTY/SCHOOL	Physical Education, Sport Science & Nutrition		
DEPARTMENT	Nutrition & Dietetics		
LEVEL OF STUDY	Undergraduate		
COURSE UNIT CODE	**2102**	**SEMESTER**	**2nd**
COURSE TITLE	**Food Microbiology**		

INDEPENDENT TEACHING ACTIVITIES in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits	**WEEKLY TEACHNG HOURS**	**CREDITS**
Lectures	3	
Laboratory Exercises	2	
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail under section 4	**5**	**6**

COURSE TYPE *Background knowledge, Scientific expertise, General Knowledge, Skills Development*	General knowledge
PREREQUISITE COURSES	No
LANGUAGE OF INSTRUCTION	Greek
LANGUAGE OF EXAMINATION/ASSESSMENT	Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/DND_U_146/

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:Συμβουλευτείτε το ***APPENDIX A***

- *Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework.*
- *Descriptive indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and* ***APPENDIX B***
- *Guidelines for writing Learning Outcomes*

The course aims to help the students comprehend the impact of microorganisms on foods. Initially, the basic principles of Microbiology regarding the several categories of microorganisms and the factors that affect their development will be presented. Then, the role of microorganisms in the food spoilage and in the pathogenesis of several human diseases will be examined in detail. In particular, the main themes of the course will be the kinds of food spoilage induced by microorganisms, and the microbiological properties of processed foods, namely foods preserved in low temperature and in modified packaging atmosphere, foods after the addition of preservatives and dehydrated, thermal processed and irradiated foods. Additionally, the microbiology of canned and fermented foods will be studied, and the marker microorganisms will be extensively examined. Finally, under the frame of Laboratory Microbiology, the students will be informed about the necessary equipment of a Microbiology Research Lab, whereas the procedure of food sampling for analysis, the dilution liquids and the nutrient mediums as well as the Gram staining will be presented. Moreover, the students will also obtain the necessary knowledge and skills to continue their studies in postgraduate and PhD levels in relevant fields. They will also be able to seek research studies from the international literature by using the most established search engines (e.g., Pubmed) and, finally, they will develop the ability to publically present a scientific article, which is relevant to the research field of the course.

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

Search for, analysis and synthesis of data and information by the use of appropriate technologies, Adapting to new situations Decision-making Individual/Independent work Group/Team work Working in an international environment Working in an interdisciplinary environment Introduction of innovative research	*Project planning and management Respect for diversity and multiculturalism Environmental awareness Social, professional and ethical responsibility and sensitivity to gender issues Critical thinking Development of free, creative and inductive thinking …… (Other…….citizenship, spiritual freedom, social awareness, altruism etc.) …….*

- Individual/Independent work
- Group/Team work
- Working in an interdisciplinary environment
- Introduction of innovative research
- Development of free, creative and inductive thinking

3. COURSE CONTENT

- Introduction - Historic overview of food microbiology
- Microorganisms in foods
- Factors affecting microorganism development/growth
- Food spoilage
- Microbiology of foods preserved in low temperature
- Microbiology of foods preserved in modified packaging atmosphere
- Microbiology of foods with preservatives
- Microbiology of dehydrated foods
- Microbiology of thermal processed foods
- Microbiology of canned foods
- Microbiology of fermented foods
- Microorganisms as markers of food quality and safety
- Microbiology of irradiated foods
- Food microbiological analysis

Laboratory exercises

- Food Microbiology Lab - Introduction
- Safety rules
- Laboratory mathematics
- Sampling procedure of microorganisms present in foods
- Preparation of culture media and diluents
- Staining in microorganisms
- Introduction in microscopy
- Observation of samples using microscopy
- Proliferation of bacteria
- Rules for the measurement of microorganism populations
- DNA and RNA electrophoresis
- Isolation of nucleic acids and proteins
- Review

4. TEACHING METHODS - ASSESSMENT

MODES OF DELIVERY *Face-to-face, in-class lecturing, distance teaching and distance learning etc..*	Face to face
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY *Use of ICT in teaching, Laboratory Education, Communication with students*	1. Lectures in power point documents 2. Research or review papers in pdf documents 3. Laptops for the projection of relevant videos 4. The lectures in pdf documents that are announced to the students The students get in touch with the instructor either directly (through face to face or email) or indirectly (through notes posted on poster boards and the website of the Department or uploaded at the eclass platform)

COURSE DESIGN *Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc. The study hours for each learning activity as well as the hours of self-directed study are given following the principles of the ECTS.*	***Activity/Method***	***Semester workload***
	Lectures	3 × 10 = 30
	Laboratory exercises	2 x 13 = 26
	Presentations	3 × 3 = 9
	Literature analysis	25
	Preparation of public presentation	25
	Preparation for the exams	35
	Total	***150***
STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS *Detailed description of the evaluation procedures:* *Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other……etc.* *Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.*	The assessment language is Greek. Regarding theory, the performance of the students is assessed through written exams (80%) and the presentation of an article relevant to the scope of the course (20%). The performance of the students in the laboratory is assessed through the written laboratory exams (100%).	

5. SUGGESTED BIBLIOGRAPHY

-Suggested bibliography:

- Karl R. Matthews, Kalmia E. Kniel, Thomas J. Montville, Food Microbiology: An Introduction. ASM Press, 4th Edition, 2017
- Lynne McLandsborough, Food Microbiology Laboratory. CRC Press, 1st Edition, 2017.

-Scientific Journals:

- Journal of Applied Microbiology
- Frontiers in Microbiology
- International Journal of Food Microbiology
- Food Microbiology