

COURSE OUTLINE

1. GENERAL

SCHOOL	FOOD AND NUTRITIONAL SCIENCES		
ACADEMIC UNIT	FOOD SCIENCE AND HUMAN NUTRITION		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	3360	SEMESTER	5 th
COURSE TITLE	FOOD MICROBIOLOGY		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	WEEKLY TEACHING HOURS		CREDITS
	5		5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Special background		
PREREQUISITE COURSES:	General Microbiology, Biology, Biochemistry		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERACSMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://oeclass.aua.gr/eclass/courses/332/		

2. LEARNING OUTCOME

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

The course is the principal introductory module to the fundamental concepts of food microbiology.

The syllabus aims to introduce students to the core principles of food microbiology, with special emphasis on the development of the hurdle concept and its applications for enhancing food quality and safety. It also covers introductory methodological aspects related to the influence of intrinsic (pH, water activity, redox potential) and extrinsic (humidity, temperature, gaseous atmosphere) factors on the behaviour (growth/survival) of microorganisms in foods.

Finally, the course seeks to ensure students understand the significance of microbial activity in food spoilage, with the objective of prolonging shelf-life and improving the safety and quality of food products.

Upon successful completion of the course, the student will be able to:

- Understand the fundamental and critical characteristics of microorganisms of relevance to food microbiology, particularly those associated with food spoilage and safety.
- Acquire knowledge of the tools and techniques required for the enumeration of microbial loads in foods.
- Employ contemporary methodologies for the quantification of microbial populations in food matrices.
- Interpret the results of microbiological analyses for the assessment of the microbiological quality of foods.
- Distinguish the principal roles of intrinsic and extrinsic factors that determine the growth, survival, or inactivation of microorganisms in foods.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>
<i>Decision-making</i>	<i>Respect for the natural environment</i>
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Teamwork</i>	<i>Criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>.....</i>
<i>Production of new research ideas</i>	<i>Others...</i>

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Adapting to new situations
- Decision-making
- Working independently
- Teamwork
- Working in an international environment
- Working in an interdisciplinary environment
- Production of new research ideas
- Production of free, creative and inductive thinking

3. SYLLABUS

- Basic concepts. Microorganisms of relevance in Food Microbiology
- Factors affecting the behaviour (growth/survival/death) of microorganisms in foods
- Hurdle concept
- Intrinsic factors affecting the behaviour of microorganisms in foods (pH, buffer capacity, water activity, redox potential, food matrix, nutrients)
- Extrinsic factors affecting the behaviour of microorganisms in foods (temperature, relative humidity, modified atmosphere)
- Natural antimicrobial systems
- Hurdles of microbiological origin
- Conventional and rapid methods for the enumeration of microorganisms in foods
- Basic principles of microbial ecology: The concept of natural habitat, niche, and domain

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face										
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of ICT technologies in teaching and communication with students (E-mail, Microsoft Teams, E-class)										
TEACHING METHODS <i>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	<table border="1"> <thead> <tr> <th>Activity</th><th>Semester workload</th></tr> </thead> <tbody> <tr> <td>Lectures</td><td>70</td></tr> <tr> <td>Laboratory practice</td><td>30</td></tr> <tr> <td>Individual study</td><td>25</td></tr> <tr> <td>Course total</td><td>125</td></tr> </tbody> </table>	Activity	Semester workload	Lectures	70	Laboratory practice	30	Individual study	25	Course total	125
Activity	Semester workload										
Lectures	70										
Laboratory practice	30										
Individual study	25										
Course total	125										
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple-choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically defined evaluation criteria are given, and if and where they are accessible to students.</i>	Language of evaluation: Greek Written final exam. Compilation of short-answer questions, problem solving, and multiple-choice questions Examination criteria are publicly available and accessible to students on E-class										

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography: • Montville, T.J., Matthews, K.R. (2005) Food Microbiology. ASM Press, Washington DC, USA • Adams, M.R., Moss, M.O. (2008) Food Microbiology. Royal Society of Chemistry, Cambridge, UK • Jay, M.J., Loessner, M.J., Golden, D.A. (2005) Modern Food Microbiology, 7th Edition, Springer Publishers, USA - Related academic journals: • International Journal of Food Microbiology, Food Microbiology, Journal of Food Protection, Journal of Food Safety, Food Research International, Foods, Microorganisms.
