

COURSE OUTLINE

(1) GENERAL

SCHOOL	FOOD AND NUTRITIONAL SCIENCE		
ACADEMIC UNIT	FOOOD SCIENCE AND HUMAN NUTRITION		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	3434	SEMESTER	8 ^o
COURSE TITLE	Microbiology of Milk and Milk Products		
INDEPENDENT TEACHING ACTIVITIES 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	WEEKLY TEACHING HOURS	CREDITS	
Lectures and Laboratory exercises	5	5	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE general background, special background, specialised general knowledge, skills development	Field of Science		
PREREQUISITE COURSES:	Food Microbiology, Dairy Science, Technology of Milk and Milk Products		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:			
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://oeclass.aua.gr/eclass/modules/document/index.php?course=588		

LEARNING OUTCOMES

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 qualification 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 aims to inform students about the microbiology of milk and milk products. Emphasis is placed on the identification and discrimination of the desired starter cultures and their use in producing safe fermented milk products with specific organoleptic and functional characteristics. Finally, special attention is drawn to the microbiological spoilage and safety of dairy products, as well as to the safety and hygiene practices in the dairy industry.

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

- Identify the natural microflora of milk, the spoilage and pathogenic microorganisms of its products.
- Recognize the microbiological quality and safety of milk and its products, both during the production process and during their preservation and distribution.
- Explain microbial fermentations in dairy products
- Apply the tools and techniques of hygienic management and safety of dairy products.
- Be able to select and apply the basic microbiological analyses to control their quality and safety.
- Interpret the causes of microbial degradation of product quality and develop direct ways to deal with them.
- Create and present a plan or study to improve the quality and safety of milk and its products, collaborating with fellow students.

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?

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

Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
... ..
Others...
... ..

Overall, the course aims to:

- Decision making
- Autonomous work
- Teamwork and cooperation capacity
- Promotion of free, creative, and inductive thinking
- Plan and manage the quality and safety of dairy products
- Search, analysis, and synthesis of data and information using the necessary technologies to evaluate the quality of products

(2) SYLLABUS

Lectures:

1. Introduction to Milk Microbiology
2. Natural microflora of raw milk – Sources of microbial contamination of milk
3. Microbiology and specifications of thermite, pasteurized, and high-pasteurized milk
4. Microbiology, microbiological changes, and other defects of UHT and powder milk
5. Microbiology, microbiological changes, and other defects of condensed milk
6. Microbiology, microbiological changes, and other defects of cream and butter.
7. Microbiology, microbiological changes, and other defects of ice cream.
8. Microbiology, microbiological changes, and other defects of yogurt, and other fermented milk products
9. Lactic acid bacteria used in the Dairy Industry
10. Microbiology, microbiological changes, and other defects of cheeses (Fresh, Ripened, Hard, and soft cheeses)
11. Microbiology of mold-ripened cheeses
12. Hygiene of Dairy Industries
13. Foodborne diseases from consumption of Dairy products

Laboratory courses:

1. Microbiological analyses of pasteurized milk products and milk powder.
2. Microbiological analyses of high-heat-treated milk products (ESL, UHT, Evaporated milk)
3. Quality control of Lactic acid bacteria (LAB) starter cultures (Purity, viability, acidification activity, production of aromatic compounds)
4. Microbiological analyses of yogurt.
5. Microbial analyses of cheeses (Fresh and Ripened cheeses)
6. Microbiological analyses of cream and butter.
7. Presentation of group work

(3) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	In the classroom, by using teaching visual aids (Projector Lessons, Video, slides)		
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Supporting the learning process through the electronic platform e-class and MS Teams https://oeclclass.aua.gr/eclass/modules/document/index.php?course=588		
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>	Activity	Semester workload	
	13 weekly lectures (2 h/ lecture)	60	
	Laboratory exercises with the active participation of students in the evaluation of various dairy products	25	
	Work (individual or collectively)	15	

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		
	Total Course (25 hours Course and training) per credit unit)	100
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure 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 Specifically defined evaluation criteria are given, and if and where they are accessible to students.	Greek is the course exam's language (and English for ERASMUS students) - The final score results from both the theoretical and laboratory rates (percentages) 60 % and 40 % respectively. - The score of the theoretical part results from the final (written) exam. The score of the laboratory part results from: 30% (i. + ii) and 70% (iii). i. The successful performance of experiments ii The work (related to the processing of the experimental data) and iii. The final examination at the end of each semester	

(4) ATTACHED BIBLIOGRAPHY

Recommended bibliography: • Mantis A., Papageorgiou D., Fletouris D., Aggelidis A. (2015). <i>Hygiene and Technology of Milk and Milk Products</i>. Ed. Kyriakidi Bros A.E. ISBN 960-343-594-X. • <i>Microbiology in Dairy Processes: Challenges and Opportunities</i>. Palmiro Poltronieri (Ed.), Willey-Blackwell (2017). • Robinson, R.K. (2005). "<i>Dairy Microbiology Handbook. The Microbiology of milk and milk products</i>" New York: Willey- Interscience. Related-journals: • Food Microbiology • Journal of Food Protection • International Dairy Journal • International Journal of Dairy Technology • Dairy Science and Technology
