DAIRY SCIENCE

COURSE OUTLINE

1. GENERAL

SCHOOL	**School of Food and Nutritional Sciences**		
ACADEMIC UNIT	**FOOD SCIENCE AND HUMAN NUTRITION**		
LEVEL OF STUDIES	**INTEGRATED MASTER**		
COURSE CODE	**350**	**SEMESTER**	**5°**
COURSE TITLE	**DAIRY SCIENCE**		
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 (Theory) and Practical Lessons (Laboratory Exercises)		**3L+2P**	**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*	**Specialised general knowledge**		
PREREQUISITE COURSES:	**Food Chemistry, Food Microbiology**		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	**Greek**		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	**No**		
COURSE WEBSITE (URL)	**https://oeclass.aua.gr/eclass/courses/ETDA189/**		

2. 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 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 lesson [350] is a basic prerequisite for the lessons Dairy Technology I [1620] and Dairy Technology II – Cheese Science [3401].
The aim of the lesson [350] is to provide current scientific knowledge for the physicochemical and biological characteristics, the properties and the complex interactions that occur in milk, as well as, for the necessary treatments in order milk to be used for food or ingredients production.
Upon successful completion of this course the students will be able to:
– be aware of the composition, structure, microbiota and physical properties of raw milk, the interactions of the structural components and the effect of food environment on them and the effect of processing on milk features.
– be aware of the analytical methodology for the evaluation of the quality of milk utilized as a raw material for the food manufacturing sector.
– have acquired critical thinking skills needed to solve problems related to raw milk as biological material and as raw material for the food industry.

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	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Teamwork	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	……..

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

3. SYLLABUS

LECTURES

1. Composition, structure and variability of milk. Biosynthesis and secretion of milk. Production and exploitation of milk.
2. Lipids. Milk fat globule.

3. Proteins. Structure and destabilization of casein micelles.
4. Lactose, physicochemical properties of particular importance for the Dairy Technology.
5. Salts. Distribution in various phases of milk and equillibria changes.
6. Minor components of milk. Lipids other than triglycerides, vitamins.
7. Endogenous - native – milk enzymes.
8. Microorganisms of raw milk. Sources of contamination, factors. Microorganisms of technological interest.
9. Properties of milk: organoleptic – sensory - characteristics, acidity and buffering capacity, density and specific gravity, redox potential.
10. Factors affecting milk yield and composition: genetic, physiological and environmental. Particularities of the milk from small ruminants.
11. Measures to improve the quality of raw milk. Mastitis. Storage and handling of raw milk.
12. Effect of processing on the characteristics of raw milk.
13. Technological, nutritional and biological potential of milk and milk fractions and components.

LABORATORY EXERSICES

1. Introduction. Legislation, regulations, sampling and treatment of milk samples. Organization of analysis scheme for raw milk before processing.
2. Basic quality indices (acidity, pH). Regulations.
3. Milk composition -I (fat and moisture).
4. Milk composition -II (total protein, casein, serum proteins).
5. Milk composition -III (ash and chloride).
6. Milk composition -IV (lactose, reference method).
7. Microbiological quality of raw milk I (total mesophilic counts, direct and indirect methods).
8. Microbiological quality of raw milk II (indices of hygiene, coliforms).
9. Physical properties of milk (density and freezing point)
10. Automated (routine methods) for milk analysis
11. Determination of somatic cells counts. Mastitis.
12. Detection of antibiotics
13. Adulteration of milk. Problem solving.