

COURSE OUTLINE

1. GENERAL

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|--|--|-----------------|----------|
| SCHOOL | School of Food and Nutritional Sciences | | |
| ACADEMIC UNIT | FOOD SCIENCE AND HUMAN NUTRITION | | |
| LEVEL OF STUDIES | INTEGRATED MASTER | | |
| COURSE CODE | 1620 | SEMESTER | 7 |
| COURSE TITLE | DAIRY TECHNOLOGY I | | |
| 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 | |
| <i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i> | | | |
| COURSE TYPE general background, special background, specialised general knowledge, skills development | Specialised general knowledge | | |
| PREREQUISITE COURSES: | Dairy Science, Food Microbiology, Food Engineering | | |
| LANGUAGE OF INSTRUCTION and EXAMINATIONS: | Greek | | |
| IS THE COURSE OFFERED TO ERASMUS STUDENTS | YES (in English) | | |
| COURSE WEBSITE (URL) | https://oeclass.aua.gr/eclass/modules/document/?course=ETDA178 | | |
| INSTRUCTORS Lectures & Laboratory Exercises | LECTURES Theofilos Massouras, Professor Ekaterini Moschopoulou, Assistant Professor LABORATORY EXERCISES Theofilos Massouras, Professor Ekaterini Moschopoulou, Assistant Professor Evangelia Zoidou, Teaching Assistant Theodoros Paschos, Technical staff | | |

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 course material aims to provide up-to-date scientific knowledge about the transformation of milk into milk products (except cheese)

Specifically, it refers to mechanical, chemical and microbiological processes that take place during the production process of dairy products (heated milk, milk powders, fermented milks, cream, butter and ice cream products), so that the student acquires a comprehensive understanding of the processes and critical parameters of the production of these products as well as the interpretation of the principles on which each process is based.

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

- Have the critical thinking and skills required to manage milk intended for production and quality control of dairy products.
- Know the tools and techniques of the management and production process of dairy products.
- Interpret problems and invent ways to deal with them.
- To create and present a design in a case study, working with his 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?

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|---|---|
| <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>Team work</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> |
| | <i>.....</i> |

Acquisition, analysis and synthesis of data and information with the use of relevant technologies.

Knowledge flexibility and adaption in new scientific environment

Independent work

Work in interdisciplinary environment

Development of new research ideas

Respect and consideration on issues of diversity, difference and multiculture

Respect to ecosystems

Social and ethical responsibility and sensitivity on male/female issues

Critical thinking

Promotion of free, creative and analytical thinking

3. SYLLABUS

Lectures:

1. Introduction. Greek, European Union and world dairy sector.
2. Raw milk production and management, transport and quality control.
3. Design dairy plants and dairy equipment
4. Mechanical and thermal treatments of milk (cleaning, centrifugation, homogenization, - standardization, pasteurization, sterilization).
5. Technology for *manufacturing condensed milk* and milk powder manufacture.
6. Technology of fermented milk products (yogurt, buttermilk, kefir, etc.),
7. Ice cream technology
8. Technology of milk fat fraction products (cream, butter, anhydrous milk fat, butter oil).
9. Membrane Separation Technology in Dairy Processes
10. New technologies and product development in dairy industry
11. Technology of dairy products with probiotic microorganisms
12. Effect of various treatments on the characteristics of dairy products.

13. Milk and milk products packaging. Legislation of milk and its products

Laboratory courses/exercises:

1. Milk industry equipment (presentation of the pilot units of the Dairy Laboratory)
2. Mechanical Milking. Visiting facilities of milking installations
3. Indicators for Heat Treatment of Milk
4. Homogenization: Milk Homogenization Control / homogenizers
5. Milk Fat products: centrifugation, standardization of milk and its products
6. Physicochemical characteristics of milk cream. Analyses
7. Butter/butter oil production
8. Visit to a milk industry
9. Physicochemical characteristics of butter. Analyses
10. Ice cream production
11. Production of fermented milk products (yogurt)
12. Fatty acid composition of dairy products

4. TEACHING and LEARNING METHODS - EVALUATION

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|--|---|---------------------------------|
| <p style="text-align: center;">DELIVERY</p> <p><i>Face-to-face, Distance learning, etc.</i></p> | <p>Face-to-face, In the classroom Distance learning, when necessary</p> | |
| <p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</p> <p><i>Use of ICT in teaching, laboratory education, communication with students</i></p> | <p>Power point and video presentations Asynchronously by means of the platform e-class, also employed for communication with the students. Distance learning by means of MS Teams platform. Use of special software for nutritional data analysis E-mail</p> | |
| <p style="text-align: center;">TEACHING METHODS</p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><i>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></p> <p><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></p> | <p>Activity</p> | <p>Semester workload</p> |
| | <p>13 weekly lectures (3 h/ lecture + personal study)</p> | <p>39</p> |
| | <p>Laboratory exercises on the manufacture of various cheese varieties and cheese analysis in small groups of students</p> | <p>26</p> |
| | <p>Personal study</p> | <p>50</p> |
| | <p>Written reports on laboratory exercise</p> | <p>10</p> |
| <p style="text-align: center;">STUDENT PERFORMANCE EVALUATION</p> <p><i>Description of the evaluation procedure</i></p> <p><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></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are</i></p> | <p>Language examination: Greek (English for ERASMUS Students)</p> <p>Evaluation of the student:</p> <p>THEORY: Written final exam in Greek (100%) on the content of the Lectures that combines short-answer questions, open-ended questions, multiple choice questionnaires.</p> <p>LABORATORY: Written final exam in Greek (80%) and (if requested) written reports (20%). When reports have not been requested, written final exam (100%).</p> <p>The exam questions are derived from the textbooks offered to the students, the material posted on e-class</p> | |
| <p>Total contact hours and training</p> | | <p>125</p> |

5. ATTACHED BIBLIOGRAPHY

Selections of textbooks that are available through the online service "EVDOXOS"

- Zerfirides G., *Technology of Dairy Products*. Yahoudis Publications: Thessaloniki, 2001.
- Mantis A., Papageorgiou D., Fletouris D & Angelidis A. *Hygiene and Technology of Milk and Products*, Kyriakidis Publications S.A. 2015, ISBN 978-960-602-017-9

Other suggestions books

- *Dairy Processing Handbook. Tetra Pack Processing Systems AB S221 86 Lund, Sweden.*
- Walstra P., Vouters J. & Geurts, T. (2006) *Dairy Science and Technology, 2nd Ed.*, CRC Press - Taylor & Francis Group
- Puniya A.K. (2016) *Fermented milk and dairy products*. CRC Press – Taylor & Francis Group
- Park Y.W.& Haenlein G.F.W., *Milk and Dairy Products in Human Nutrition*. Wiley-Blackwell, UK, 2013.

Scientific Journals

- *Journal of Dairy Science*
- *Journal of Dairy Research*
- *International Dairy Journal*
- *Dairy Science and Technology*
- *International Journal of Dairy Technology*
- *Innovative Food Science and Emerging Technologies*
- *Foods*
- *Dairy*