

## COURSE OUTLINE

### 1. GENERAL

|                                                                                                                                                                                                                             |                       |                                                                                                                                   |                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| SCHOOL                                                                                                                                                                                                                      |                       | Food and Nutritional Sciences                                                                                                     |                          |
| ACADEMIC UNIT                                                                                                                                                                                                               |                       | Food Science & Human Nutrition                                                                                                    |                          |
| LEVEL OF STUDIES                                                                                                                                                                                                            |                       | Bachelor                                                                                                                          |                          |
| COURSE CODE                                                                                                                                                                                                                 |                       | 124                                                                                                                               | SEMESTER 9 <sup>th</sup> |
| COURSE TITLE                                                                                                                                                                                                                |                       | Food Product Development                                                                                                          |                          |
| INDEPENDENT TEACHING ACTIVITIES                                                                                                                                                                                             | WEEKLY TEACHING HOURS |                                                                                                                                   | CREDITS                  |
| <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> |                       |                                                                                                                                   |                          |
| Lectures and laboratory experiments                                                                                                                                                                                         |                       | 5 (3+2)                                                                                                                           | 5                        |
|                                                                                                                                                                                                                             |                       |                                                                                                                                   |                          |
| Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).                                                                                                           |                       | 5                                                                                                                                 | 5                        |
| COURSE TYPE<br><i>general background, special background, specialised general knowledge, skills development</i>                                                                                                             |                       | Specialised general Knowledge                                                                                                     |                          |
| PREREQUISITE COURSES:                                                                                                                                                                                                       |                       | Physical Properties of Foods, Food Engineering, Food Preservation, Unit Operations in Food Engineering, Quality Assurance Systems |                          |
| LANGUAGE OF INSTRUCTION and EXAMINATIONS:                                                                                                                                                                                   |                       | Greek                                                                                                                             |                          |
| IS THE COURSE OFFERED TO ERASMUS STUDENTS                                                                                                                                                                                   |                       | no                                                                                                                                |                          |
| COURSE WEBSITE (URL)                                                                                                                                                                                                        |                       | <a href="https://oeclclass.aua.gr/eclass/courses/304/">https://oeclclass.aua.gr/eclass/courses/304/</a>                           |                          |

### 2. LEARNING OUTCOMES

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| <p><b>Learning outcomes</b></p> <p>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.</p> <p>Consult Appendix A</p> <p>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</p> <p>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</p> <p>Guidelines for writing Learning Outcomes</p>                                                                  |
| <p>The course material includes the:</p> <p>Technological development of a new food product by turning an innovative idea into a novel product.</p> <p>Upon successful completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Enumerate the stages of developing a new product</li> <li>• Design an idea/scenario</li> <li>• Apply the principles of new product development to implement an idea</li> <li>• Solve problems related to food product development</li> <li>• Use the methodology of experimental design (response surface methodology)</li> <li>• Collaborate with classmates to present a new product</li> </ul> |
| <b>General Competences</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| <p><i>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></p> |                                                                                          |
| 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...                                                                                |
| <p>Retrieve, analyse and synthesize data and information<br/>Produce new research ideas<br/>Team working<br/>Development of creative and free inquiry-based thinking to acquire advanced skills</p>              |                                                                                          |

### 3. SYLLABUS

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| <p>Introduction and overview. Chapters' description and specific goals<br/>Stages of food product development<br/>Idea generation. Examples. Ideas evaluation<br/>Find market gaps. Perceptual maps. Examples (Lab. 1)<br/>From an idea to a concept. Using an idea map for concept evaluation. Examples (Lab. 2)<br/>Process development. Stages description. Examples.<br/>Protocept (requirements, formulation, ingredients selection). Evaluation (Lab. 3)<br/>Prototype. Process flow chart, specifications, packaging considerations, performance testing. Shelf-life considerations (Lab. 4,5,6)<br/>Scale-up. Final product specs. Use of experimental designs for product optimization (Lab. 7)<br/>Patents. Examples presentation.<br/>Accelerated storage. Examples.<br/>Consumer testing. Product roll out. Roadblocks to success. Sensory evaluation best performed products selection.<br/>Project presentations (Lab. 8)</p> <p>The above lectures will be complemented with laboratory experiments on the following topics:</p> <p>Perceptual map creation<br/>Questionnaire for ideas selection. Concept development. Concept evaluation through specific evaluation cards. Patents.<br/>Protocept. Formulation development (raw materials, amounts) and process conditions. Experimental trials<br/>Experimental design (response and design parameters, theory and implementation in the laboratory)<br/>Food product optimization (selected products upon experimental designs)<br/>Final products evaluation (use and storage)<br/>Final products presentation and discussion</p> |
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### 4. TEACHING and LEARNING METHODS - EVALUATION

|                                                                         |                                                      |
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| <p><b>DELIVERY</b><br/><i>Face-to-face, Distance learning, etc.</i></p> | <p>In class teaching (power point presentations)</p> |
|-------------------------------------------------------------------------|------------------------------------------------------|

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Face-to-face                                                                                                                                                                                                                                                                                                                                                                                                           |          |                   |          |    |                     |    |                                 |    |                |    |              |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------|----------|----|---------------------|----|---------------------------------|----|----------------|----|--------------|-----|
| <b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b><br><i>Use of ICT in teaching, laboratory education, communication with students</i>                                                                                                                                                                                                                                                                                                                                                                                                     | Specific software experimental design                                                                                                                                                                                                                                                                                                                                                                                  |          |                   |          |    |                     |    |                                 |    |                |    |              |     |
| <b>TEACHING METHODS</b><br><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><br><br><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>36</td></tr> <tr> <td>Laboratory practice</td><td>24</td></tr> <tr> <td>Term papers/individual homework</td><td>35</td></tr> <tr> <td>Personal study</td><td>30</td></tr> <tr> <td>Course total</td><td>125</td></tr> </tbody> </table>                                                    | Activity | Semester workload | Lectures | 36 | Laboratory practice | 24 | Term papers/individual homework | 35 | Personal study | 30 | Course total | 125 |
| Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Semester workload                                                                                                                                                                                                                                                                                                                                                                                                      |          |                   |          |    |                     |    |                                 |    |                |    |              |     |
| Lectures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 36                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                   |          |    |                     |    |                                 |    |                |    |              |     |
| Laboratory practice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 24                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                   |          |    |                     |    |                                 |    |                |    |              |     |
| Term papers/individual homework                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 35                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                   |          |    |                     |    |                                 |    |                |    |              |     |
| Personal study                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 30                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                   |          |    |                     |    |                                 |    |                |    |              |     |
| Course total                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 125                                                                                                                                                                                                                                                                                                                                                                                                                    |          |                   |          |    |                     |    |                                 |    |                |    |              |     |
| <b>STUDENT PERFORMANCE EVALUATION</b><br><i>Description of the evaluation procedure</i><br><br><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><br><br><i>Specifically defined evaluation criteria are given, and if and where they are accessible to students.</i> | <ul style="list-style-type: none"> <li>- Final written examination (50% of the final course grade) that includes some or all of the following: <ul style="list-style-type: none"> <li>-Short-answer questions</li> <li>-Judgment questions/Problem solving</li> <li>- Multiple choice questionnaires</li> </ul> </li> <li>II. Laboratory participation - written works (25%)</li> <li>III. Term paper (25%)</li> </ul> |          |                   |          |    |                     |    |                                 |    |                |    |              |     |

## 5. ATTACHED BIBLIOGRAPHY

-Suggested bibliography:

Σφλώμος Κ.- Βαρζάκας Θ., Έρευνα & Ανάπτυξη νέων προϊόντων & Επιχειρηματικών Σχεδίων, 2017, Εκδόσεις NOTA, ISBN: 978-618-83264-4-6

Brody, A.L., and Lord, J.B. 2007. New Food Products for a Changing Marketplace Taylor and Francis, Inc., New York

Fuller, G.W. 1994. New Food Product Development: From Concept to Marketplace CRC Press, Washington D.C. 0849380022, 9780849380020

Fuller, G.W. 2010, Food, Consumers, and the Food Industry: Catastrophe or Opportunity? Taylor & Francis, 0849323266, 9780849323263

Moskowitz, H. R., Saguy, I. S., Straus, T. 2010. An Integrated Approach to New Food Product Development. CRC Press. eBook ISBN 9780429191657

Singh P.R., Heldman D.R., Εισαγωγή στη μηχανική Τροφίμων, 5η έκδοση, Παρισιανού Α.Ε., Επιμέλεια: Γιαννιώτης Σ., Στοφόρος Ν., Τζια Κ., Ελληνική μετάφραση: Επιστημονικές Εκδόσεις Παρισιανού Α.Ε., Αθήνα, 2019.  
ISBN: 978-960-583-184-4

Λαζαρίδης Χ.Ν., Γούλα Α.Μ., Μηχανική Τροφίμων Εκδόσεις Τζιόλα 2023

Brody, A.L. & Lord, J.B., Developing new food products for a changing marketplace, 2008

- Related academic journals:

LWT-Food Science & Technology

Journal of Food Science. Division: Food Engineering, Nanotechnology, Material Science

Journal of Food Engineering

WEb sites:

<http://www.preparedfoods.com/> (Prepared Foods).

<http://www.foodproductdesign.com/toolbar.html> (Food Product Design).

<http://www.foodnavigator.com/>

<http://www.ift.org/food-technology.aspx>

<http://www.bakeryandsnacks.com>