

## COURSE OUTLINE

### 1. GENERAL

<b>SCHOOL</b>	AGRICULTURAL SCIENCES		
<b>ACADEMIC UNIT</b>	FOOD SCIENCE AND TECHNOLOGY		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	<b>FST_404</b>	<b>SEMESTER</b>	4 <sup>th</sup>
<b>COURSE TITLE</b>	FOOD PRODUCTION FROM AQUATIC ECOSYSTEMS		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <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>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
Lectures	3		
Exercises	2		
	<b>5</b>	<b>5</b>	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	<i>Compulsory general background skills development</i>		
<b>PREREQUISITE COURSES:</b>	No prerequisite courses		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek / English		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>COURSE WEBSITE (URL)</b>	<a href="http://foodscitech.upatras.gr/?page_id=1595">http://foodscitech.upatras.gr/?page_id=1595</a>		

### 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 outcome of this course is to provide the students with the basic knowledge for the aquatic ecosystems through their physicochemical and biological characteristics in order to possess the ability of understanding the basic elements of the energy flow and, consequently, the food production from these ecosystems.

In particular, after the successful completion of this course the student will be in position:

- To possess the basic knowledge of the physicochemical and biological characteristics of the aquatic ecosystems, as well as of the energy flow and the food production.

#### 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*

*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*

<i>Team work</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an international environment</i>	.....
<i>Working in an interdisciplinary environment</i>	<i>Others...</i>
<i>Production of new research ideas</i>	.....

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision making
- Working independently
- Team work
- Respect for the natural environment
- Criticism and self-criticism
- Production of free, creative and inductive thinking
- Project planning and management

### 3. SYLLABUS

The course content includes the following:

1. Introduction: water and its significance, origin, distribution. The sea environment
2. The abiotic environment: light, temperature, salinity, nutrient components, oxygen concentration, density, pH, water pressure, the movements of water masses. Recording of the physicochemical parameters
3. The biotic environment: phytoplankton and zooplankton, feeding, horizontal and vertical distribution, migration
4. Benthos of the different sediment types, respiration and feeding of benthic organisms, Sediment selection. Sampling methods. Type of benthic organisms.
5. Osmotic regulation in the water environment. Adaptation of mechanisms for floatation. Life in the great depths
6. Productivity of the aquatic ecosystems. Pollution of aquatic ecosystems
7. Management of aquatic biological resources
8. Fisheries
9. Aquaculture. Methods. Type of aquaculture.
10. Fish culture in the marine environment.
11. Aquaculture of various organisms (shells, branchiopods, crustaceans, algae)
12. Economic and social elements. The future of aquaculture.

### 4. TEACHING and LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	<i>Face-to-face, Hands-on experience with ICT</i>	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	<i>Lectures using Power Point presentations, suspension of educational material in eclass</i>	
<b>TEACHING METHODS</b> <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>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	39
	Lab exercises	26
	Bibliographic work	30
	Non-directed study	27
	Exams	3
Course total	<b>125</b>	

<p style="text-align: center;"><b>STUDENT PERFORMANCE EVALUATION</b></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 accessible to students.</i></p>	<ul style="list-style-type: none"> <li>• Short-answer questions,</li> <li>• Open-ended questions,</li> <li>• Written work,</li> <li>• Essay/report</li> </ul>
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## 5. ATTACHED BIBLIOGRAPHY

<p>- <u>Suggested bibliography</u></p> <ul style="list-style-type: none"> <li>• LUCAS, J.S., SOUTHGATE, P.C., TUCKER, C.S. (2021). Καλλιέργεια υδρόβιων ζώων και φυκών. Εκδόσεις ΚΩΝΣΤΑΝΤΑΡΑΣ</li> <li>• CASTRO, P and HUBER, M. E. (1999). Θαλάσσια Βιολογία, University Studio Press, Thessaloniki.</li> <li>• ΘΕΟΔΩΡΟΥ, Α. Ι. (1996). Εισαγωγή στο Θαλάσσιο Περιβάλλον, Πανεπιστήμιο Βόλου, Βόλος.</li> <li>• BARNES, R. S. K. &amp; MANN, K. H. (1991). <i>Fundamentals of Aquatic Ecology</i>, Blackwell Scientific Publications</li> <li>• SUMICH, J. J. (1996). <i>An Introduction to the Biology of Marine Life</i>, (6th Edition). McGraw-Hill.</li> </ul> <p>- <u>Relevant scientific journals</u></p> <ul style="list-style-type: none"> <li>• Nature</li> <li>• Limnology &amp; Oceanography</li> <li>• Marine Biology</li> <li>• Marine Ecology-Progress Series</li> <li>• Journal of Plankton Research</li> <li>• Journal of Applied Ichthyology</li> <li>• Fisheries Research</li> <li>• Oceanography</li> <li>• Aquatic Geochemistry</li> <li>• ICES Journal of Marine Science</li> <li>• Bulletin of Marine Science</li> <li>• Journal of Freshwater Ecology</li> <li>• Frontiers in Marine Science</li> <li>• Helgoland Marine Research</li> </ul>
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