

## COURSE OUTLINE

### 1. GENERAL

<b>SCHOOL</b>	Agricultural Sciences		
<b>ACADEMIC UNIT</b>	Animal Production, Fisheries & Aquaculture		
<b>LEVEL OF STUDIES</b>	Undergraduate		
<b>COURSE CODE</b>	<b>AS_503</b>	<b>SEMESTER</b>	<b>5<sup>th</sup></b>
<b>COURSE TITLE</b>	Aquaculture		
<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>
		5 (3h-lectures + 2h lab. training)	6
<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>	Special background		
<b>PREREQUISITE COURSES:</b>	Ichthyology		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek, English		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>COURSE WEBSITE (URL)</b>			

### 2. LEARNING OUTCOMES

<p><b>Learning outcomes</b></p> <p><i>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.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> <li><i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i></li> <li><i>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i></li> <li><i>Guidelines for writing Learning Outcomes</i></li> </ul>								
<p><b>The student, at the end of the relevant Learning Process, is able:</b></p> <p><b>To understand the importance of aquaculture for humans.</b></p> <p><b>To use appropriately the existing aquaculture literature .</b></p> <p><b>To organize the exploitation plan for a certain aquaculture.</b></p> <p><b>To be aware of the principles of aquaculture management in accordance with environmental legislation.</b></p>								
<p><b>General Competences</b></p> <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> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td> <td style="width: 50%;"><i>Project planning and management</i></td> </tr> <tr> <td><i>Adapting to new situations</i></td> <td><i>Respect for difference and multiculturalism</i></td> </tr> <tr> <td><i>Decision-making</i></td> <td><i>Respect for the natural environment</i></td> </tr> <tr> <td></td> <td><i>Showing social, professional and ethical responsibility and</i></td> </tr> </table>	<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>Showing social, professional and ethical responsibility and</i>
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<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>Showing social, professional and ethical responsibility and</i>							

<i>Working independently</i>	<i>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>Production of new research ideas</i>	<i>Others...</i>
	.....

  

<p>Respect for the natural environment</p> <p>Decision making</p> <p>Autonomous work</p> <p>Teamwork</p> <p>Application of knowledge</p> <p>Search, analyze and synthesize data and information, using the necessary technologies</p> <p>Adapt to new situations</p>
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### 3. SYLLABUS

1. History of aquaculture. Glossary.
2. Purpose of aquaculture.
3. Typical and widely cultivated species.
4. Biological basis of aquaculture.
5. Forms of aquaculture. Extensive, Intensive and recirculation aquaculture.
6. Aquaculture of algae.
7. Aquaculture of zooplankton. Aquaculture of invertebrates.
8. Aquaculture. The basic elements of physiology and metabolism of farmed organisms.
9. Fundamentals of management of livestock. Food Management.
10. Standard aquaculture equipment.
11. The basic and critical physicochemical parameters. Hydrostatic. Hydrodynamics. Water quality.
12. Methodology for estimating pollution from aquaculture. Cleaning and disinfection of water treatment equipment and systems.
13. Handling salinity. Measurement of oxygen levels in water and parameters of water quality (Temperature, Oxygen, Salinity, pH, NO<sub>3</sub>, NO<sub>2</sub>, NH<sub>3</sub>). Calculation of water and air supply. Nourishment of cultivated organisms. Estimation of growth and other breeding performance.

#### **Laboratory exercises**

1. Educational visit to lagoon facilities.
2. Measurement and handling of salinity.
3. Oxygenometer-pHmeter function learning.
4. Learn how to measure nitrogen compounds in water.
5. Anaesthesia of fish.
6. Measurement of water and air supply in breeding tanks.
7. Cleaning the tanks.
8. Educational visit to a marine aquaculture unit.
- 9, 10, 11. Cultivation of rotifers in the laboratory.
12. Cultivation of Artemia in the laboratory.
13. Painless bioethical killing of fish for marketing.

## TEACHING and LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Face to face	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	ICT in teaching and communication with students	
<b>TEACHING METHODS</b>  <i>The manner and methods of teaching are described in detail.</i>  <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>  <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>
	1. Lectures 3 hours x 13 weeks.	39
	2. Further study, search and study of lecture material, associated with (1) (3 hours x 13 weeks)	39
	3. Laboratory Exercises 2 hours x 13 weeks.	26
	4. Writing of brief reports of laboratory exercises or laboratory examination related to (3) (1 x 6 hrs)	6
	5. Self-assessment exercises in e-class (1 x 6 weeks)	6
	6. Writing of short work presentation (1 x 13 weeks)	13
	7. Hours of study and preparation for laboratory exercises, assessment of progress (s) and final examination	18
	8. Final examination	3
	<b>Course total</b>	<b>150</b>
<b>STUDENT PERFORMANCE EVALUATION</b>  <i>Description of the evaluation procedure</i>  <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>  <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to</i>	<ul style="list-style-type: none"> <li>• Greek (Teaching, Examination)</li> <li>• English (Teaching, Exam)</li> </ul> <ol style="list-style-type: none"> <li>1. Solving Problems Based on Learned (Formative - Concluding) (A)</li> <li>2. Report / Report (Concluding) (B)</li> <li>3. Written Final Examination (Concluding) (C)</li> </ol> <p>Each case is graded on a scale of 0-10            Final Grade (TB): <math>0.3A + 0.2B + 0.5C</math>            C takes place during the current exam period, which is taught in the course and its iteration (September) (period where A, B &amp; C scores are maintained). In</p>	

<i>students.</i>	case of failures of the course the student repeats the educational process.
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#### 4. ATTACHED BIBLIOGRAPHY

Suggested Bibliography:

- Voutsiadou E., Abatzopoulos Th., Antonopoulou E., Ganias, K., Gelis S., Staikou A., Triandafyllidis A. 2015. AQUACULTURE-Organizations, production systems, perspectives. SEAV, ISBN: 978-960-603-184-7.
- FAO, 2015. Global Aquaculture Production. Available: <http://www.fao.org/fishery/statistics/global-aquaculture-production/en>.
- FAO, 2014. The State of World Fisheries and Aquaculture. Rome, FAO, 197p.
- FAO, 2015. Cultured Aquatic Species Information Program, Aquaculture Fact Sheets. In: FAO Fisheries and Aquaculture Department [online]. Rome. Available: <http://www.fao.org/fishery/culturedspecies/search/en>.

Related scientific journals:

Aquaculture

Fisheries Research