

## COURSE OUTLINE

### 1. GENERAL

<b>SCHOOL</b>	AGRICULTURAL SCIENCES		
<b>ACADEMIC UNIT</b>	ANIMAL PRODUCTION, FISHERIES AND AQUACULTURE		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	AS_702	<b>SEMESTER</b>	7 <sup>th</sup>
<b>COURSE TITLE</b>	BREEDING BIOTECHNOLOGY		
<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>	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>	5 (3h-lectures + 2h lab. training)	7	
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	Special Background		
<b>PREREQUISITE COURSES:</b>	There are 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>			

### 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> </ul>
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- *Guidelines for writing Learning Outcomes*

After the successful completion of the course, students should be able to

- Explain the structure and operation of the breeding unit and the equipment used on a case-by-case basis depending on the breeding species of animal – bird – fish.
- Organize and manage the supply and acclimatization of incoming newborn animals - bird chicks - fish fry.
- Explain the nutritional needs of each species of animal - bird - fish and propose the use of nutritional – balance supplements.
- Explain, organize and apply vaccinations, therapeutic treatments, and implement the basic principles of preventing / managing the introduction of stress into farming populations.
- Completes and evaluates the GOOD PRACTICE RECORDS in: 1) Examination of breeding water, 2) Transport of newborn and adult Animals - Birds - Fishes, 3) Application of Anti-suffocation measures, 4) Examination of applied technology in fattening animals in stables / cells / cages, birds in cages, fishes in tanks / cages, 5) Use of Genitor Registry for all farmed species of Animals - Birds - Fishes, 6) Use of individual Cage / Tank record in a newborn animal unit - bird chick incubation unit – fish hatchery, 7) Sending Animal, Bird and Fish Samples for Laboratory Examinations, 8) Radiologic Examination.

### **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?*

<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>

- Applying scientific knowledge
- Search, analysis and synthesis of data and information, using the necessary technologies
- Decision-making
- Working independently
- Team work
- Criticism and self-criticism

### **3. SYLLABUS**

In particularly the course is analyzed in follow modules:

1. A brief review at the choice of breeds in Animal - Bird - Fish livestock. The main farmed species in Greece (growth rates, mortality, pathological factors and environmental restrictions on farming).
2. Stables / cells / cages, bird cages, fish tanks / cages: Criteria for the selection of places for the establishment of animal farm – bird farm - fish farm, quality criteria for breeding water, special equipment for breeding units
3. Managing livestock populations: unit population stocking, animal - bird - fish farming manipulations (feeding, body sizing, mortality records / losses records), slaughtering – fishing.
4. Designing a special diet plan in relation to breeding restrictions.
5. Use - Proper application of prescribed anesthetics and therapeutic formulations to animals – birds - fish of all ages.
6. Choice of vaccines and good practice in the vaccination procedure of animals - fish birds. Vaccination by Injection (intramuscular and / or subcutaneous and / or intraperitoneal), feed, drinking water, immersion (bathing for juveniles).
7. Stress: Introduction to farmed fish population and techniques to manage it.
8. Prevention and killing of predators.
9. Environmental impacts.
10. Tasks: 1) Task of head-officer of Genitors Section & BIONUTRICS Laboratory, 2) Task of head officer of Incubator – Pre-fattening Section – Fattening section.
11. GOOD PRACTICE RECORDS in: 1) Examination of breeding water, 2) Transport of newborn and adult Animals - Birds - Fishes, 3) Application of Anti-suffocation measures, 4) Examination of applied technology in fattening animals in stables / cells / cages, birds in cages, fishes in tanks / cages, 5) Use of Genitor Registry for all farmed species of Animals - Birds - Fishes, 6) Use of individual Cage / Tank record in a newborn animal unit - bird chick incubation unit – fish hatchery, 7) Sending Animal, Bird and Fish Samples for Laboratory Examinations, 8) Radiologic Examination.
12. Manuals: 1) Manual of Clinical Signs and Mortal Findings, 2) Manual of Clinical Pharmacology, 3) Operation Manual of Bird Incubator Section and Fish Hatchery.
13. Innovation in Breeding Biotechnology in the coming decades.

**Laboratory exercises:**

1. Learning of biological agents that restrict and / or exclude the farming of Animals - Birds – Fishes.
2. Learning of technical parameters for good practice in animal-bird-fish farming.
3. Learning of animal - bird - fish farming manipulations.
4. Learning the cases of need to design a special diet plan.
5. Learning the commercial anesthetic and therapeutic formulations that are prescribed in the Greek market.
6. Learning the commercial vaccines that are prescribed in the Greek market.

7. Learning the proposed process and management techniques to treat stress according to the farmed species of animals - birds – fish.
8. Learning of good practice on the prevention and killing predators.
9. Learning of good practice to manage environmental impacts during the farming unit's operation.
10. Learning the use of tasks.
11. Learning to complete the Good Practice Records.
12. Learning how to use the manuals.
13. Proposed innovations in Breeding Biotechnology.

#### 4. 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>	<ul style="list-style-type: none"> <li>• Use of ICT in teaching (Power-Point presentations)</li> <li>• Uploading of lecture slides and other educational material on E-class</li> <li>• Communication with the students through the online platform E-class.</li> </ul>	
<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	43
	8. Final examination	3
	Course total	175
<b>STUDENT PERFORMANCE EVALUATION</b>  <i>Description of the evaluation procedure</i>	<ul style="list-style-type: none"> <li>• Greek Language (Teaching, Examination)</li> <li>• English Language (Teaching, Examination)</li> </ul>	

<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>	<ol style="list-style-type: none"> <li>1. Solving Problems Based on Taught (Formative - Concluding) (A)</li> <li>2. Written Report / Oral Report (Concluding) (B)</li> <li>3. Written Final Examination (Concluding) (C)</li> </ol> <p>Each case is graded on a scale of 0-10</p> <p>Final Grade (FG): <math>0.3A + 0.2B + 0.5C</math> otherwise: Final Grade (FG): <math>0.3A + 0.7C</math></p> <p>(C) takes place during the current examination period that the lesson is taught, and its iteration (September) (period where A &amp; B scores are maintained). In case of failures of the course the student repeats the Written Final Examination (C).</p> <p>Students with learning difficulties are examined orally.</p>
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## 5. ATTACHED BIBLIOGRAPHY

<p><i>- Suggested bibliography:</i></p> <ul style="list-style-type: none"> <li>• Ayodeji Adeoye, 2011. Fish Nutrition, p. 60, Lambert Academic Publishing.</li> <li>• G. Joan Holt, 2011. Larval Fish Nutrition, Wiley-Blackwell</li> <li>• John E. Halver, 2013. Fish Nutrition, Academic Press.</li> </ul> <p><i>- Related academic journals:</i></p> <ul style="list-style-type: none"> <li>• Journal of the Hellenic Veterinary Medical Society</li> <li>• Farmers Journal. Search Farmers Journal. <a href="http://www.informationvine.com/Farmers+Journal">www.informationvine.com/Farmers+Journal</a></li> <li>• Journal of Aquaculture Feed Science and Nutrition. Medwell Journals</li> <li>• A review of some Fish Nutrition Methodologies. ScienceDirect</li> <li>• Aquaculture, ScienceDirect.com <a href="https://www.sciencedirect.com/journal/aquaculture">https://www.sciencedirect.com/journal/aquaculture</a></li> <li>• Fisheries and Aquaculture Journal – Open Access Journals. <a href="https://www.omicsonline.org/fisheries-and-aquaculture">https://www.omicsonline.org/fisheries-and-aquaculture</a>.</li> </ul>
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