COURSE OUTLINE

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPT. OF ANIMAL PRODUCTION, FISHERIES AND AQUACULTURE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**AS_700**	**SEMESTER**	**VII**
COURSE TITLE	ICHTHYOPATHOLOGY & DIAGNOSTICS		

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**
	5	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialized general knowledge, Skills development
PREREQUISITE COURSES:	Recommended: Comparative Animal Anatomy - Physiology, Ichthyology, Microbiology, Cellular - Molecular Biology, Immunology & Nosology
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek, English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	… to be constructed

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*

On successful completion of this unit, the students will be able to:

- ✓ **Describe and compare the most frequent pathological phenomena in fish, with emphasis on cultivated Teleosts, at the cellular, histological, organics, systemic and organismic levels.**
- ✓ **Know the most important causes of fish disease, along with the probable pathogenetic mechanisms, as well as their most probable outcomes.**
- ✓ **Comprehend the usually encountered alterations and malfunctions, for each organ or organic system, as well as their implications for the health of the individuals up to the clinical presentations.**
- ✓ **Appraise and apply the most commonly used diagnostic methodologies for disease and utilize the most appropriate techniques for the investigation of the aetiological agents of every type of disease.**
- ✓ **Recognize, predict, analyze and evaluate the importance of pathological issues, real or potential, in the context of any general activity concerning aquatic animal 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	*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*
Team work	*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…*
	…….

- ➢ **Application of knowledge.**
- ➢ **Search for, analysis and synthesis of data and information, with the use of the necessary technologies.**

- **Adapting to new situations.**
- **Decision-making.**
- **Working independently.**
- **Team work.**
- **Working in an interdisciplinary environment.**
- **Production of free, creative and inductive thinking.**

3. SYLLABUS

- Basic principles and terms of pathology (injury-dysfunction, necrosis, apoptosis, degeneration).
- General phenomenology (stress, lesion, haemorrhage, oedema, inflammation, hyperplasia, hypertrophy, atrophy, neoplasia, ulceration etc.).
- Introduction to fish pathology.
- Aetiological analysis of fish diseases (environmental, nutritional, genetic, contagious or indefinable causes).
- Systematic pathology (integumental, locomotory, respiratory, digestive, circulatory, neural etc.).
- Examination methodology (history taking, clinical signs, biopsy/necropsy, post-mortem anatomy).
- Methodology for sample taking and packaging-sending. Δειγματισμός και συσκευασία-αποστολή δειγμάτων.
- The Pathological Laboratory, its organization and operation.
- Special diagnostic techniques (radioscopic, haematological, histopathological, microbiological, biochemical, immunobiological, biomolecular).
- Case studies (investigation of incidents).

4. TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face-to-face</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Use of ICT in all teaching/learning activities.</td></tr>
<tr><td>TEACHING METHODS

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.

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</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures and Study & analysis of bibliography</td><td>39</td></tr>
<tr><td>Laboratory practice and/or Seminars</td><td>26</td></tr>
<tr><td>Non-directed study</td><td>85</td></tr>
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<tr><td>Course total</td><td>150</td></tr>
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<tr><td>STUDENT PERFORMANCE EVALUATION

Description of the evaluation procedure

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

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Language, Greek and/or English

1. Oral examination (summative-conclusive) (A)
2. Written final examination – Short-answer questions and/or multiple choise questions (conclusive) (B)
Each one to be graded in a 0-10 scale.

Final grade (FG):

FG= 0,2A+0,8B when B≥5, else:
FG= B
‘A’ is done concurrently with the teaching process;
‘B’ takes place in the examinations period as regulated.

In case of failure the student should repeat the procedure.</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

Suggested bibliography:

- **Fish Disease: Diagnosis and Treatment (2nd Edition): Edward J. Noga (2010). Wiley-Blackwell, 536 pages, ISBN 978-0813806976**
- **Systemic Pathology of Fish (2nd Edn.): H. Ferguson et al. (2006). Scotian Press, 368 pages, ISBN 978-0955303708**
- **Fish Pathology (4th Edition): Ronald J. Roberts (2012). Wiley-Blackwell, 590 pages, ISBN 978-1444332827**

Related academic journals:

- **Fish Pathology: The Japanese Society of Fish Pathology, ISSN 0388-788X (print) 1881-7335 (online), (http://www.fish-pathology.com/)**
- **Journal of Aquatic Animal Health: American Fisheries Society (Fish Health Section) - Taylor & Francis, (http://www.tandfonline.com/toc/uahh20/current)**