

**Fish Farming**

Code: 102671  
ECTS Credits: 3

Degree	Type	Year	Semester
2502445 Veterinary Medicine	OT	5	0

**Contact**

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**Use of Languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: Yes  
Some groups entirely in Spanish: No

**Teachers**

Marcelo Amills Eras  
Francesc Padros Bover

**Prerequisites**

There are no official prerequisites to attend this course. However, it is recommended that students have basic knowledge about fish physiology and its relation to their environment and /or to have completed and passed the "Aquaculture and Ictiopathology" course (3th year, Veterinary Medicine Degree).

**Objectives and Contextualisation**

The degree of knowledge about fish aquaculture is still scarce when compared to other animal productions. The Fish Aquaculture course delves into the different systems of fish maintenance and production. It covers fish production both for food and for ornamental purposes.

Students will be introduced to the different strategies and production systems, their critical points and the further development of fish aquaculture. Likewise, it emphasizes the role that students, as veterinarians, can have within this productive sector. Over the last few years, the veterinarian has approached the world of fish farming very slowly and, mainly, in aspects related to health. It can also play a prominent role in other areas that directly affect production such as nutrition and genetics, among others.

As specific objectives, the student will be trained:

- a) to identify factors that determine the profitability in fish production,
- b) to assess which implications has on the environment and animal welfare
- c) to apply the knowledge acquired in the recognition of technical problems or management of a fish farm and in the reasoned approach of strategies for its improvement / resolution.

**Competences**

- Analyse, synthesise and resolve problems and make decisions.
- Apply scientific method to professional practice, including medicine
- Comunicar la informació obtinguda durant l'exercici professional de manera fluïda, oralment i per escrit, amb altres col·legues, autoritats i la societat en general.
- Demonstrate knowledge and understanding of the aspects of organisation, finance and management in all fields of the veterinary profession.
- Demonstrate knowledge of English to communicate both orally and in writing in academic and professional contexts.
- Value and interpret the production and health parameters of one animal group, considering the economic and welfare aspects.

## Learning Outcomes

1. Analyse, interpret and evaluate the production and healthcare parameters of a farm or fishery and produce a plan of corrective actions considering the factors of animal welfare, environmental protection and product quality.
2. Analyse, synthesise and resolve problems and make decisions.
3. Apply scientific method to professional practice, including medicine
4. Communicate information obtained during professional exercise in a fluid manner, orally and in writing, with other colleagues, authorities and society in general.
5. Demonstrate knowledge of English to communicate both orally and in writing in academic and professional contexts.
6. Recognise and resolve the economic aspects that affect livestock and fishery production and health.

## Content

Theory (9 hours) (TE)

- General principles in fish production.
- Management throughout fish production cycle
- Sustainability, environmental management.
- Ornamental fish production and trade.

Seminars (SEM)

*Seminars* (6 hours)

Resolution of practical cases related to:

- Water quality and needs.
- Genetics in fish aquaculture.
- Productive parameters and quality of final product.
- Economic impact of the health management in fish farm.

Cases (6 hours; 3h/case) : 2 cases (presentation + monitoring + presentation and discussion)

Visits (5 hours) (VEXT)

Includes two technical visits:

- *IRTA Aquaculture Center*, where the student will see all the facilities for different phases of marine species production, mainly those related to recirculation aquaculture systems (RAS).

- *L'Aquarium of Barcelona*. It aims to show how is the management of large aquariums and everything that involves the maintenance of a large number of species with different characteristics and requirements.

## Methodology

The center of the learning process is student's own work. The teacher's mission to help in this learning process would be twofold. First, providing them with information and second, showing them sources where they can get it. Supervise them is essential.

Following this ideas, and according to the objectives, the development of this course is based on the following methodologies and activities:

### 1.- *Participative lectures in the classroom*

The student acquires the expertise of the course by attending lectures about the basics on fish aquaculture. The participation and interaction of the student during lectures will be encouraged in this one-way method of transmission of knowledge from teacher to student.

### 2.- *Seminars - Case studies*

They are the basic and practical complement to the master classes. It is intended that trough team or group work, the student adopt an active role in the learning process in order to increase student's motivation. The specific objective may vary depending on the type of seminar, although always seeking to promote the analysis, reasoning, discussion and resolution capacity by the student.

Two different types of seminars are included. Seminars will be focused in the resolution problems in the classroom. In Case studies, the resolution will take place over three sessions. During the first, the teacher will present the case and the guidelines for its development. In the second session, the development of the case will be checked, and new guidelines will be established for the final resolution (third session). A report must be submitted prior to the final discussion.

### 3.- *Technical visits*

*They are basic to see the practical application of the concepts given during theoretical and practical lectures. Two technical visit are planned.*

*The teaching material that will be used throughout the course will be available in the Moodle platform of the subject.*

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lectures	9	0.36	1
Seminars	12	0.48	1, 2, 3, 4, 5
Technical visits	5	0.2	2
Type: Autonomous			
Preparation of case studies	26	1.04	1, 2

Study	20	0.8	1
Visits report	3	0.12	4

## Assessment

- *There is no final exam.*
- *The evaluation of the subject will take place from the evaluations of:*
  - *oral presentation and correction reports of self-learning cases (maximum 50%)*
  - *resolution of problems in seminars (maximum 20%)*
  - *technical visits (maximum 15%)*
  - *attendance + participation (maximum 15%)*
- *A minimum attendance of 60% of the set of face-to-face activities of the subject (theoretical lectures, seminars and technical visits) is required in order to pass.*
- *A minimum of 4 points out of 10 is needed in each of the evaluable parts, in order to be able to mediate with the rest of the parties and be able to pass the subject.*
- *Any student who has only a maximum of 15% of the total grade will be considered non-evaluable.*

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Assistance and participation	15 % final mark	0	0	1, 2, 3, 4, 5, 6
Oral presentation and correction of self-learning cases	50 % final mark	0	0	1, 2, 4, 5
Resolution of problems in seminars	20 % final mark	0	0	2, 6
Technical visits	15 % final mark	0	0	1, 6

## Bibliography

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- Bone, Q and Moore, R.H. 2008. Biology of Fishes. Taylor & Francis Group.
- Brown, .L . 1993. Aquaculture for veterinarians: fish husbandry and medicine. Pergamon Press. Oxford.
- Coll Morales, J. 1991. Acuicultura marina animal. 3ª ed. Mundi-Prensa. Madrid.
- Guillaume, J.; Kaushik, S.; Bergot, P.; Metailler, R. (Eds.) 1999. Nutrition et alimentation des poissons et crustacés. INRA Editions.
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Lucas, J.S.; Southgate, P. C. 2003. Aquaculture. Farming aquatic animals and plants. Fishing New Books.

Ortega, A. 2008. Cuadernos de Acuicultura 1. Cultivo de Dorada (*Sparus aurata*). Fundación Observatorio Español de Acuicultura. Madrid.

Roberts, H.E. 2010. Fundamentals of Ornamental Fish Health. Wiley-Blackwell.

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Pillay, T. V. R. i Kutty, M.N. 2005. Aquaculture : principles and practices. 2nd Ed. Blackwell. Oxford.

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Stickney R. R. 2000. Encyclopedia of aquaculture. John Wiley & Sons. New York.

Wedemeyer, G. 1996. Physiology of fish in Intensive culture systems. Chapman & Hall, International Thompson Publishing, New York.

#### Pàgines web recomanades

- <http://aquaTIC.unizar.es/>

- <http://mispeces.com/>

- <http://fao.org/>

- <http://www.fundacionoesa.es>