

## Production and Health Management in Aquaculture Facilities (I002878)

**Course size** (nominal values; actual values may depend on programme)

**Credits 8.0**

**Study time 200 h**

**Course offerings in academic year 2025-2026**

A (semester 1)

English

Gent

**Lecturers in academic year 2025-2026**

Masaló Llorca, Ingrid

BARCELO3 lecturer-in-charge

Gil Roig, José Maria

BARCELO3 co-lecturer

Kallas Calot, Zein

BARCELO3 co-lecturer

Oca, Joan

BARCELO3 co-lecturer

Reig Puig, Maria Lourdes

BARCELO3 co-lecturer

**Offered in the following programmes in 2025-2026**

**crdts**

**offering**

[International Master of Science in Health Management in Aquaculture](#)

8

A

**Teaching languages**

English

**Keywords**

*Intensive aquaculture systems, Recirculation systems, facilities engineering, tank design, environmental enrichment, carrying capacity, bioprogramming, routine operations, stock control, feeding management, technical decisions, aquaculture economics, marketing strategies, cost-benefit analysis*

**Position of the course**

*This course aims at introducing into the design of aquaculture facilities, the production management, and the analysis and improvement of the competitiveness aquaculture industries*

**Contents**

### **1. Production and health management**

- Bioprogramming a fish farm facility to ensure health, welfare, and sustainability
- Influence of technical decisions on the viability of the operation
- Routine operations in an aquaculture facility: main criteria and procedures
- Stock control: monitoring growth, biomass, number of individuals, and stocking density
- Feeding management: method, frequency, time

### **2. Engineering of aquaculture production systems**

- Introduction to marine aquaculture systems
- Design criteria of aquaculture tanks and environmental enrichment
- Site considerations, pump selection, and flow control
- Required flow rates and carrying capacity in flow-through systems
- Water treatment
- Recirculating Aquaculture Systems

### **3. Economics for Aquaculture**

- Price Determination in Aquaculture Markets
- Agrofood Marketing
- Market trends, innovation, and consumer behavior
- Cost-Benefit Analysis

## Initial competences

*General biology, use of spread-sheets (i.e. excel)*

## Final competences

- 1 Identify the criteria for defining the product, management and location to implement an aquaculture operation that guarantees the fish welfare and health
- 2 Develop the productive program (bioprogramming) of a fish farm according to these criteria
- 3 Identify the influence of technical decisions and routine operations on fish health
- 4 Identify the basic design criteria and engineering principles needed to set up and manage a successful aquaculture system
- 5 Assess the technical management of an aquaculture company, considering economic and welfare aspects
- 6 Assess the business management of an aquaculture company
- 7 Make decisions concerning the management and maintenance of the facilities
- 8 Understand the functioning of Aquaculture Markets and Value Chain
- 9 Knowledgeable about how aquaculture companies face market challenges
- 10 Understand the economic tools for decision making

## Conditions for credit contract

This course unit cannot be taken via a credit contract

## Conditions for exam contract

This course unit cannot be taken via an exam contract

## Teaching methods

Group work, Seminar, Excursion, Lecture, Practical, Independent work

## Study material

None

## References

- FAO (2020) El estado mundial de la Pesca y la Acuicultura (SOFIA) <http://www.fao.org/fishery/sofia/en>
- HUGUENIN, J.E. and COLT J. 1989. Design and operating guide for aquaculture seawater systems. Elsevier. Amsterdam.
- HUNTINGFORD, F. (2010) Aquaculture and behavior. Ed. Wiley-Blackwell, UK
- JANA, S. (2018). Socioeconomic Impacts and Cost-Benefit Analysis of Wastewater-Fed Aquaculture. In Wastewater Management Through Aquaculture (pp. 269-284). Springer, Singapore.
- JOBLING, M. (1994) FISH BIONERGETICS. Chapman and Hall. Fish and Fisheries Series 13. London, UK.
- LAWSON, T. 1995. Fundamentals of Aquacultural Engineering. Chapman & Hall. New York
- LEKANG, O.I. (2007) AQUACULTURE ENGINEERING. Blackwell Publishing, UK.
- MIDLEN, A.B., REDDING, T.A. (1998) Environmental management for aquaculture. Chapman & Hall, London, UK
- PILLAY, T.V. (1992) Aquaculture and the Environment. Fishing News Books. London, England.
- RANKING, J. C. & JENSEN, F. B. (1993) FISH ECOPHYSIOLOGY. Fish and Fisheries Series, 9. Chapman & Hall, UK.
- ROSS, L. G. and ROSS, B. (2000) ANAESTHESIC AND SEDATIVE TECHNIQUES FOR AQUATIC ANIMALS. Wiley-Blackwell; 2<sup>nd</sup> Edition, UK.
- STICKNEY, R.R., McVEY, J. P. (2002) Responsible marine aquaculture. CABI Publishing, Oxon, UK
- WEDEMEYER, G.A. (1996) PHYSIOLOGY OF FISH IN INTENSIVE CULTURE SYSTEMS. Chapman and Hall. USA.
- TIMMONS, M.B. and LOSORDO, T.M. 1994. Aquaculture water reuse systems: engineering design and management. Elsevier. Amsterdam
- TIMMONS, M.B. and EBELING, J.M. 2010. Recirculating Aquaculture (2nd Ed). NRAC Publication No. 401-2010

## Course content-related study coaching

Teacher available for student counselling

## Assessment moments

end-of-term and continuous assessment

**Examination methods in case of periodic assessment during the first examination period**

Peer and/or self assessment, Written assessment with open-ended questions, Written assessment, Assignment

**Examination methods in case of periodic assessment during the second examination period**

Oral assessment, Written assessment with open-ended questions

**Examination methods in case of permanent assessment**

Oral assessment, Skills test, Peer and/or self assessment, Assignment

**Possibilities of retake in case of permanent assessment**

examination during the second examination period is possible in modified form

**Calculation of the examination mark**

*30% Bioprogramming case-study; 30% Written examination; 30% Presentation of the individual report; Whole duties attendance and accomplishment 10%.  
Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.*