

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

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

<b>Course size</b>	<i>(nominal values; actual values may depend on programme)</i>		
<b>Credits</b> 8.0	<b>Study time</b> 200 h	<b>Contact hrs</b>	50.0 h

### Course offerings in academic year 2022-2023

A (semester 1)	English	Gent
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### Lecturers in academic year 2022-2023

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 2022-2023

	crdts	offering
<a href="#">International Master of Science in Health Management in Aquaculture</a>	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

Guided self-study, excursion, group work, lecture, online discussion group, practicum, project, seminar, self-reliant study activities, seminar: coached exercises, seminar: practical PC room classes

## Learning materials and price

*syllabus*

## 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*

## Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination with open questions, written examination, portfolio, peer assessment, report

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

Written examination with open questions, oral examination

**Examination methods in case of permanent evaluation**

Oral examination, portfolio, skills test, peer assessment, report

**Possibilities of retake in case of permanent evaluation**

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.*