

## Diseases in Aquaculture (I002796)

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

**Credits 6.0**

**Study time 180 h**

**Course offerings in academic year 2024-2025**

A (semester 1)

English

Gent

**Lecturers in academic year 2024-2025**

Declercq, Annelies

LA22

lecturer-in-charge

Chantziaras, Ilias

D108

co-lecturer

Decostere, Annemie

D105

co-lecturer

Hermans, Katleen

D105

co-lecturer

**Offered in the following programmes in 2024-2025**

**crdts**

**offering**

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

6

A

[International Master of Science in Marine Biological Resources](#)

6

A

[Master of Science in Aquaculture](#)

6

A

[Exchange Programme in Bioscience Engineering: Agricultural Sciences \(master's level\)](#)

6

A

### Teaching languages

English

### Keywords

Bacterial, parasitic and viral diseases, antibiotics, antibiotic resistance, identification and enumeration of micro-organisms, virulence, probiotics, immunostimulants, vaccination, handling & sampling techniques.

### Position of the course

The aim of the course is to understand the importance of microbial, viral and parasitic diseases in aquaculture, how to enumerate micro-organisms, to convey methodologies to prevent, to cure microbial diseases and how to handle, manipulate and sample fish.

### Contents

1. Bacterial morphology
2. Enumeration methods for bacteria (including PCR, ELISA)
3. Antibiotics and antibiotic resistance, vaccination and immunostimulants in aquaculture
4. overview of a selection of relevant aquatic animal diseases
5. Hygiene and sanitation
6. Probiotics
7. Case studies of (marine) fish hatcheries, including vaccination protocols
8. Handling/sampling techniques
9. Basic principles in epidemiology and ethical issues
10. Practical lab work on bacterial antibiotics susceptibility, bacterial plasmid conjugation, quorum sensing, bacterial virulence factors. Practical work on the setup of experimental scientific research on fish diseases

### Initial competences

General biology, chemistry, biochemistry and basic knowledge on aquaculture.

### Final competences

- 1 The student has insight into microbial morphology.
- 2 The student has insight into techniques to enumerate bacteria.
- 3 The student has knowledge on aquatic animal diseases and their causative/eliciting agents.

- 4 The student has insight into the pathogenesis of microbial diseases.
- 5 The student has insight into the importance of hygienic techniques in an aquaculture environment.
- 6 The student understands techniques for disease prevention, including the use of probiotics, immunostimulants and vaccines.
- 7 The student understands techniques for disease mitigation such as the use of antibiotics and bacteriophages.
- 8 The student has knowledge on handling and sampling techniques.
- 9 The student is able to enumerate aquaculture pathogens.
- 10 The student is able to determine antibiotic resistance transmission among bacterial species.
- 11 The student has knowledge on basic principles in epidemiology and ethical issues

#### **Conditions for credit contract**

Access to this course unit via a credit contract is determined after successful competences assessment

#### **Conditions for exam contract**

This course unit cannot be taken via an exam contract

#### **Teaching methods**

Lecture, Practical

#### **Extra information on the teaching methods**

Theory lectures: lectures based on powerpoint presentations.

Practical classes: microbiological experiments on antibiotic susceptibility, bacterial conjugation, virulence factors and quorum sensing in small groups. reflection on the setup of scientific experimental research regarding fish diseases including regulatory, practical and ethical aspects

#### **Study material**

None

#### **References**

Bacterial diseases of fish (Inglis, Roberts & Bromage)

Finfish and shellfish bacteriology manual (Whitman)

Asia diagnostic guide to aquatic animal diseases (FAO fisheries technical paper 40212)

Fish Diseases and disorders: Volume 1, 2 & 3 (Woo, Leatherland, Bruno)

#### **Course content-related study coaching**

Study guidance upon request by email or on appointment.

#### **Assessment moments**

end-of-term and continuous assessment

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

Written assessment

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

Written assessment

#### **Examination methods in case of permanent assessment**

Participation, Assignment

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

examination during the second examination period is possible

#### **Extra information on the examination methods**

The theory is examined by a written closed book exam.

The practical classes, including participation and report, will be evaluated permanently.

#### **Calculation of the examination mark**

Out of 20:

15 points attributed to written exam

5 attributed to report on practical classes and participation in class

Students that do not attend the practical classes without a valid reason, should retake the course the next academic year.

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.