GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2023-2024

Aquaculture Environmental Impact (I000928)

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

Credits 3.0 **Study time 90 h**

Course offerings and teaching methods in academic year 2023-2024

A (semester 2)	English	Gent	lecture
			seminar

Lecturers in academic year 2023-2024

Asselman, Jana	LA22	lecturer-in-charge

Offered in the following programmes in 2023-2024	**crdts**	**offering**
Master of Science in Aquaculture	3	A
Master of Science in Environmental Science and Technology	3	A
Exchange Programme in Bioscience Engineering: Agricultural Sciences (master's level)	3	A
Exchange Programme in Bioscience Engineering: Environmental Technology (master's level)	3	A

Teaching languages

English

Keywords

Aquaculture, ecosystem, sustainability, algal blooms, ecological footprints.

Position of the course

In the past, oceans and seas were often perceived as a limitless source of seafood with an ever increasing supply of fish. However, with an increasing global population, the limits of both our terrestrial and marine food provisioning systems are becoming poignantly clear. Fish and other marine products are an important source of proteins, but as more than 30% of our fish stocks are already overfished, it is unlikely that increasing fishing activities will result in an adequate supply of proteins. Aquaculture, on the other hand, has been exponentially growing since the 1990's. is As of today, aquaculture provides already half of the fish products being consumed, providing food security in various areas around the world. However, the impacts of aquaculture on the local ecosystem cannot be neglected. For example, extensive feeding causes eutrophication, which may lead to harmful algal blooms, which on their turn endanger harvests, local ecosystems and human health. Coastal ecosystems, like mangrove forests, often with a high carbon sequestrating potential, are being removed in favor of aquaculture with consequences such as coastal erosion, biodiversity loss and a lower carbon sequestration. Antibiotics, applied to avoid losing profit due to diseases in the system, are an important cause of increasing antibiotic resistance. The impact of aquaculture on the environment should thus be taken into careful consideration in order to ensure a sustainable food supply.

Contents

The course aims at giving an extensive overview of aquaculture systems and their effects and interactions with the environment. To gain insight in said interactions, knowledge on different configurations and forms, e.g. traditional versus industrial aquaculture, is required and will be illustrated using case studies from all over the world. Additionally, the sustainability of different configurations will be discussed. Problems associated with aquaculture will be debated, such as, for example, (harmful) algal blooms with special attention to toxin production, species and monitoring. The theoretical insights in system configurations and interactions with the environment will be put into practice during the project assignment, in which the sustainability of an aquaculture systems will be assessed. Additionally, students will participate in the VLIZ Marine Science Day to gain a broad overview of environmental impact on marine ecosystems.

Initial competences

Notions on general aquaculture.

Final competences

1 The student has insight into the factors determining the sustainability of aquaculture.

2 The student can describe different aquaculture configurations including their advantages and disadvantages with regards to environmental impact

3 The student can describe the relationship between different environmental impacts (.e.g (harmful) algal blooms) and aquaculture

4 The student can quantitatively compare different aquaculture configurations in terms of sustainability and feasibility

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

Seminar, Excursion, Lecture, Independent work

Extra information on the teaching methods

Theory lectures: lectures based on powerpoint presentations.
Excursion to the VLIZ Marine Science Day
Project assignments: project assignment on the VLIZ day and an individual assingment by the end of the lectures
Seminar on a specific aquaculture case study

Learning materials and price

All learning material will be made freely available via UFORA

References

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

Assignment

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

*End-of-term assessment: written examination on content of lectures and exercise sessions
*permanent evaluation: project assignment and excursion assignment, participation in the seminar session.

Calculation of the examination mark

End-of-term assessment: 60%, permanent evaluation: 40%

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