GHENT UNIVERSITY

Course Specifications

From the academic year 2020-2021 up to and including the academic year

Aquaculture Genetics (I002795)

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

Credits 6.0 **Study time 180 h** **Contact hrs** 60.0h

Course offerings in academic year 2022-2023

A (semester 1) English Gent

Lecturers in academic year 2022-2023

Bossier, Peter LA22 lecturer-in-charge

Offered in the following programmes in 2022-2023	crdts	offering
International Master of Science in Health Management in Aquaculture	6	A
Master of Science in Aquaculture	6	A
Exchange Programme in Bioscience Engineering: Agricultural Sciences (master's level)	6	A
Exchange Programme in Bioscience Engineering: Cell and Gene Biotechnology (master's level)	6	A

Teaching languages

English

Keywords

Molecular genetic techniqus for detecting polymorphisms, qualitative and quantitative genetics, breeding programmes, chromosome manipulation, sex manipulation, polyploidisation, genetic maps.

Position of the course

This course starts with the study of the essential knowledge on genetic principles and molecular genetic techniques.
In the second part attention is paid to specific methods and implications of genetic research in aquaculture.

Contents

Theory
1. Fundamental knowledge on DNA structure
2. Molecular techniques for detecting genetic variation
3. Qualitative genetics
4. Quantitative genetics
5. F-statistics
6. Inbreeding
7. Use of androgenesis, gynogenesis and triploidisation
8. Manipulation of sexual phenotype
9. Breeding programmes
10 Genetic maps

Practical exercises
1. Handling and analysing genetic data
2. Application of molecular tools in analysis of broodstock population (paper group exercise)
3. Exercise on heritability
4. Lab exercise RFLP analyis of a mitochondrial DNA fragment

Initial competences

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

Final competences

1 The student has insight into Mendelian genetics.
2 The student has basic knowledge on heritability and quantiative genetics.
3 The student has knowledge on molecular markers and their application.
4 The student has insight into breeding strategies in aquaculture (including sex reversal).
5 The student understands the importance of inbreeding and genetic drift in aquaculture.
6 The student has insight into the construction and the use of genetic maps.
7 The student is able to amplify and analyse (RFLP) a DNA fragment.

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

Practicum, Guided self-study, Lecture, Seminar: coached exercises

Extra information on the teaching methods

Theory lectures: lectures based on powerpoint presentations.
Practical classes: RFLP experiment in small groups.
Exercises: guided exercises and calculations and group work on cloning strategies.

Learning materials and price

Printout of the powerpoint presentation will be available during all classes.
Estimated cost of the printouts: 17 euro (included in fee that is paid in the beginning of the academical year).

References

An introduction to genetic analysis (Griffits et al.)
Biotechnology and genetics in fisheries and aquaculture (Becuemont & Hoare)
Practical genetics for aquaculture (Lutz G.)
Principles of population genetics (Hartl & Clark)

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 examination

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

Written examination

Examination methods in case of permanent assessment

Report, Participation, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

Period aligned evaluation: theory: written closed book exam.
Non-period aligned evaluation: practical classes and exercise assessment: participation and report.

Calculation of the examination mark

Out of 20:
13 points attributed to written exam
2 points groupwork exercises
5 points attributed to report practical classes

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 examinator.