GHENT UNIVERSITY

Course Specifications

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

Statistical Analysis in Population Ecology (C004334)

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

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

Credits 5.0 **Study time 125 h** **Contact hrs** 39.0h

Course offerings in academic year 2021-2022

A (semester 1) English Gent

Lecturers in academic year 2021-2022

Minto, Cóilín GALWAY02 lecturer-in-charge

Offered in the following programmes in 2021-2022	**crdts**	**offering**
International Master of Science in Marine Biological Resources	5	A

Teaching languages

English

Keywords

Position of the course

Contents

This course aims to provide the theoretical and applied basis for statistical analyses of population dynamics. By providing an inferential background in likelihood and an introduction to Bayesian inference students will be equipped to analyze the oftentimes complicated experimental and observational data that arise in population ecology. It will develop students' understanding of population ecology and accompanying statistical methodology and provide for student independence through a thorough understanding of the open-source R statistical environment. Finally it will equip students to run Bayesian analyses through an introduction to applied Bayesian inference via WinBUGS

Syllabus to include:

- An introduction to R
- Probability theory of relevance to population dynamics;
- Likelihood-based inference
- Maximum likelihood estimation
- Bayesian inference;
- WinBUGS
- Density-independent population growth
- Density-dependent population growth
- Trophic interactions
- Stochasticity
- Environmental drivers

- Population harvesting
- State space analysis

Initial competences

Final competences

1 Demonstrate an understanding of the underpinnings of statistical inference.
2 Apply R programming skills.
3 Describe the theory of population dynamics.
4 Develop and apply advanced statistical models to population dynamics data.
5 Draw inference from population dynamics.
6 Describe Bayesian inference as applied to population dynamics.

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

Extra information on the teaching methods

This module utilises a case study approach, seminal research papers are evaluated and discussed by the learners. This module also uses a role play component where learners must adopt a viewpoint supported by available evidence in debate with their peers tasked with holding opposite viewpoints

Learning materials and price

none

References

Journals and other module material will be placed on moodle by the module co-ordinator

Course content-related study coaching

Students experiencing difficulties should engage with course staff, or academic support units within GMIT

Assessment moments

continuous assessment

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

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

Examination methods in case of permanent 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