GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2015-2016

Population processes (C003625)

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

Credits	6.0	Study time	180 h
Contact hrs	47.0 h		

Course offerings and teaching methods in academic year 2018-2019

A (semester 1)	Dutch	lecture	26.25 h
		seminar: coached exercises	10.0 h
		seminar: practical PC room classes	5.0 h
		project	6.25 h

Lecturers in academic year 2018-2019

Lens, Luc	WE11	lecturer-in-charge
Maere, Steven	WE09	co-lecturer

Offered in the following programmes in 2018-2019	crdts	offering
Bachelor of Science in Mathematics	6	A

Teaching languages

Dutch

Keywords

Population numbers, population growth, demography, interactions, spatial structure, exploitation, evolution of molecular biological systems

Position of the course

Students gain insight into underlying processes that determine the functioning of natural populations within an ecological and evolutionary framework. This is achieved through the study of theoretical models and applied case studies.

Contents

The ecological section of the course consists of the following chapters: estimation of population numbers, population growth, demography, competition, predation, parasitism, spatially-structured populations, exploited populations. Focus is both on the development of theoretical models (e.g. capture-recapture models, growth models, Lotka-Volterra models, SI-model, Incidence Function model, dynamic pool model) and on their use in particular case studies.
The evolutionary section comprises the chapters “Introduction to molecular evolution’, ‘Evolution of molecular biological systems within a population context’, ‘Similarities and differences between evolution and optimization of molecular systems’, ‘Individual-based evolutionary simulation models’

Initial competences

Able to apply simple techniques from infinitesimal analysis

Final competences

1 To report on the basic concepts underlying the functioning of natural populations and their genetic evolution in accurate scientific language.
2 To explain population-ecological models and assess their applicability.
3 To apply population-ecological models in ecological and genetic problem-solving.
4 To understand the interface between population ecology and other mathematical disciplines.

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, project, seminar: coached exercises, seminar: practical PC room classes

Learning materials and price

Syllabus available
Price: 20 €

References

Alstad, D.N. 2001. Basic Populus Models of Ecology. Prentice-Hall, Inc. NJ. (ISBN 0-13-021289-X)
Krebs, C.J. 2001. Ecology: the experimental analysis of distribution and abundance (5th Ed). Benjamin Cummings, NY (ISBN 0-321-04289-1)

Course content-related study coaching

During practical classes, population ecological concepts are illustrated with practical examples. During these classes, students can pose general questions on the course's content.

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination, oral examination

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

Written examination, oral examination

Examination methods in case of permanent evaluation

Assignment

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Extra information on the examination methods

Practicals: written
Theory: oral examination with written preparation. Students are evaluated on their knowledge of population-ecological concepts and insight into ecological modeling.

Calculation of the examination mark

Theory: 1/3
Practicals: 1/3
Project: 1/3