GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2018-2019

Conservation Genetics (C003326)

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

Credits	5.0	Study time	150 h
Contact hrs	57.5 h		

Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	English	self-reliant study activities	7.5 h
		seminar: practical PC room classes	30.0 h
		lecture	20.0 h

Lecturers in academic year 2018-2019

Helsen, Philippe	WE11	lecturer-in-charge
Lens, Luc	WE11	co-lecturer

Offered in the following programmes in 2018-2019	crdts	offering
Master of Science in Biology	5	A
Exchange Programme in Biology (master's level)	5	A

Teaching languages

English

Keywords

Genetic markers, genetic drift, geneflow, genetic equilibria, inbreeding, relatedness, coalescence, population viability

Position of the course

Students obtain theoretical knowledge on population-genetic concepts within an ecological (fragmented populations, management of endangered populations, sustainable hunting, ...) and evolutionairy (adaptive) framework. In addition, students will be intensively trained in commonly-used software programs for population-genetic analysis. Finally, students will be trained in applying genetic concepts and tools to real-world conservation issues.

Contents

Theoretical concepts

Introduction to conservation genetics
Overview of genetic markers
Genetically viable populations
Genetically fragmentated populations
Inbreeding and inbreeding depression
Evolution in small populations
Evolution in harvested populations
The basic of coalescence theory
Extensions of CT: selection, migration, population growth
Taxonomic uncertainties and management units
Genetic management of captive and natural populations
Case studies on population fragmentation, individual-based estimates, selection and evolution;

Analytical concepts and methods

Allelic richness, allelic diversity, HW, linkage disequilibrium, Null alleles (Genalex)
Genetic differentiation, effective population size (Genepop, LDNe)
Genetic clustering, PCoA (Structure, Genalex)

Genetic autocorrelation, geneflow, private alleles (Genalex, Bayesass, ADZE)
Inbreeding, relatedness (MLRelate, Coancestry)
Coalescence (Migrate, DNA sp)
Applied conservation genetics (Zoo Antwerp)

Initial competences

This course builds on basic concepts gained from population-ecology (population growth, demography, spatially-structured populations), genetics (heritability, genemapping, genetic interactions, functional genome analysis, epigenetics) and evolution (sources of genetic variation, random evolutionary processes, natural selection, adaptation, life-history evolution).

Final competences

1 Obtain theoretical knowledge on population-genetic concepts within an ecological (fragmented populations, management of endangered populations, sustainable hunting, ...) and evolutionairy (adaptive) framework.
2 Intensively trained in commonly-used software programs for population-genetic analysis.
3 Apply genetic concepts and tools to real-world conservation 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, self-reliant study activities, seminar: practical PC room classes

Learning materials and price

Frankham et al. 2010. Introduction to Conservation Genetics. Cambridge University Press. 642 pp. (Cost: 50 Euro)
Powerpoint slides (syllabus)
International literature (case studies)

References

Höglund 2009. Evolutionary Conservation Genetics. Oxford University Press. 189 pp.
Amato et al. 2009. Conservation Genetics in the Age of Genomics. Columbia University Press. 248 pp.
Bertorelle et al. 2009. Population Genetics for Animal Conservation. Cambridge University Press. 395 pp.
Allendorf et al. 2012. Conservation and the Genetics of Populations. Wiley John and Sons. 608 pp.

Course content-related study coaching

During the practicals, concepts taught during the theoretical classes will be applied to real-world questions, models and analyses. During these practicals, students can pose questions that cover all course topics.

Evaluation methods

end-of-term evaluation

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

Written examination with open questions, oral examination

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

Written examination with open questions, oral examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Calculation of the examination mark

Theory: 50%
Practicals: 50%