

Population Processes (C003625)

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

Credits 6.0

Study time 180 h

Course offerings and teaching methods in academic year 2026-2027

A (semester 1)

Dutch

Gent

seminar
lecture

Lecturers in academic year 2026-2027

Lens, Luc

WE11

lecturer-in-charge

Maere, Steven

WE09

co-lecturer

Offered in the following programmes in 2026-2027

[Bachelor of Science in Mathematics](#)

crdts

offering

6

A

[Master of Science in Bioinformatics\(main subject Systems Biology\)](#)

6

A

Teaching languages

Dutch

Keywords

Population numbers, population growth, demography, interactions, spatial structure, 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. Focus is both on the development of theoretical models (e.g. capture-recapture models, growth models, Lotka-Volterra models, SI-model, Incidence Function 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

(Approved)

Teaching methods

Seminar, Lecture, Independent work

Extra information on the teaching methods

Lecture recordings will be made available, provided that the scheduled auditorium or classroom is equipped with the necessary highquality recording facilities.

Study material

Type: Syllabus

Name: Population ecology

Indicative price: Free or paid by faculty

Optional: no

Language : Dutch

Number of Pages : 422

Oldest Usable Edition : 2023-24

Available on Ufora : Yes

Online Available : No

Available in the Library : No

Available through Student Association : No

Type: Slides

Name: Population ecology

Indicative price: Free or paid by faculty

Optional: no

Language : Dutch

Number of Slides : 670

Oldest Usable Edition : 2023-24

Available on Ufora : Yes

Online Available : No

Available in the Library : No

Available through Student Association : No

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.

Assessment moments

end-of-term assessment

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

Oral assessment, Written assessment with open-ended questions, Written assessment, Assignment

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

Oral assessment, Written assessment with open-ended questions, Written assessment, Assignment

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

Theory: oral exam with written preparation, assessing knowledge of population ecology concepts and understanding of modelling approaches.

Practicals: written assessment, partly with oral explanation.

Assignment: written report with oral explanation.

Calculation of the examination mark

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