GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2026-2027

Applied Freshwater Ecology (I002504)

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

Credits 3.0 **Study time 90 h**

Course offerings and teaching methods in academic year 2026-2027

A (semester 1)	English	Gent	lecture excursion seminar

Lecturers in academic year 2026-2027

Goethals, Peter	LA22	lecturer-in-charge

Offered in the following programmes in 2026-2027	**crdts**	**offering**
Bachelor of Science in Bioscience Engineering	3	A
Bachelor of Science in Environmental Technology	3	A
Master of Science in Aquaculture	3	A
Master of Science in Environmental Science and Technology	3	A
Exchange Programme in Bioscience Engineering: Agricultural Sciences (master's level)	3	A
Exchange Programme in Bioscience Engineering: Environmental Technology (master's level)	3	A
Exchange Programme in Bioscience Engineering: Land and Forest management (master's level)	3	A

Teaching languages

English

Keywords

freshwater, communities, ecological processes, exploitation, disturbance, protection, rivers, lakes, ponds, wetlands

Position of the course

This course offers general insights in the composition and functioning of freshwater systems, in both natural as (over)exploited systems. The students receive knowledge about rivers, lakes, ponds and wetlands, and are supposed to be able to analyze systems in the field concerning main components and processes, as well as the dynamic behavior of the system.

Contents

THEORY (with insight questions for stimulating the interaction): 20 h
Key freshwater systems: an overview of rivers, lakes, ponds and wetlands
Hydrology, hydraulics and hydromorphology in relation to composition and behavior of freshwater systems The specific (bio)chemical key processes of rivers, lakes, ponds and wetlands The biology of freshwater ecosystems: an overview of the diverse communities and their traits
Energy flows and storage in freshwater ecosystems
Ecostoichiometry of freshwater ecosystems
Migration in and between freshwater ecosystems
Invasion-ecology: key processes and impacts
Ecological interactions and food webs, with an emphasis on competition and predation
Behavior of freshwater ecosystems: dynamics and spatial heterogeneity
Exploitation of freshwater ecosystems: combination, optimization, overexploitation and protection

GUIDED PRACTICAL EXERCICES: 5 h
During two sessions, the students get in contact with international river systems (Mekong, Amazon, Nile, ...), large lakes (Victoria, Tonle Sap, ...), as well as Flemish water systems such as The Scheldt and large stagnant waters. The objective of these guided questions is to make students familiar with the application of the theory, especially concerning the effects of wastewater discharges, nutrient enrichment, invasions and hydropower. After a short introduction of the systems and explaining the questions, the student can individually prepare answers, that serve as a basis for a plenary discussion to solve the questions.
EXCURSION: 5 h During the field excursion, several freshwater ecosystems are visited and discussed. The objective of these visits and discussions is to prepare students via insight questions for the exam. In particular, the identification of components and processes is trained during the excursion.

Initial competences

Basic ecological knowledge concerning components and processes of ecosystems: the student can define, explain and identify key-processes and concepts of ecosystems

Final competences

1 Define and explain key terminology and concepts of freshwater ecosystems
2 Systematically analyze freshwater ecosystems concerning the composition and major processes
3 Optimize the exploitation of freshwater ecosystems (drinking water production, fisheries, aquaculture, wastewater treatment, ...) in a context of sustainability
4 Develop and defend a vision in a discussion related to the exploitation and/or disturbance of a particular freshwater ecosystem (pool, wetland, lake or river)
5 Identify the major components and processes of natural and exploited freshwater ecosystems in the field (or in pictures and videos)

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, Excursion, Lecture

Study material

Type: Slides

Name: Slides in combinatie met artikels en rapporten (in pdf)
Indicative price: Free or paid by faculty
Optional: no
Available on Ufora : Yes
Online Available : Yes
Available in the Library : No
Available through Student Association : No
Additional information: All materials are offered for free via the online learning platform

References

Diverse academic books and publications

Course content-related study coaching

Assessment moments

end-of-term assessment

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

Written assessment

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

Written assessment

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

Written examination, consisting of concise knowledge related questions,
summarizing text of part of the course, insight questions and application questions.

Calculation of the examination mark

The score is merely calculated on the basis of the written exam.