GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2025-2026

Limnology (C004466)

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

Credits 4.0 **Study time 120 h**

Course offerings and teaching methods in academic year 2026-2027

A (semester 2)	English	Gent	practical lecture seminar
B (semester 2)	English	Gent	

Lecturers in academic year 2026-2027

Verschuren, Dirk	WE11	lecturer-in-charge
Verleyen, Elie	WE11	co-lecturer
Vyverman, Wim	WE11	co-lecturer

Offered in the following programmes in 2026-2027	**crdts**	**offering**
Master of Science in Teaching in Science and Technology(main subject Biology)	4	A
Master of Science in Biology	4	A
Master of Science in Marine and Lacustrine Science and Management	4	B
Exchange Programme in Biology (master's level)	4	A

Teaching languages

English

Keywords

Physical limnology, chemical limnology, continental waters, lakes and rivers, primary production, hydrologie, aquatic ecology, nutrient budget, stoichiometry

Position of the course

The Ma1 course `Limnology´ is taught to Biology students majoring in Ecology, to students of the Master in Marine and Lacustrine Sciences & Management ('Oceans & Lakes'), and as optional course to students in diverse other majors. This course is pre-eminently system-directed in which equal attention is given to the physical, chemical and biological components of lake and pond ecosystems, and hence requires prior knowledge of basic inorganic chemistry. The biological-ecological course content builds on introductory knowledge obtained in Ba1 course `Ecology´, and more advanced material presented in Ba3 `Aquatic Ecology´ and (as case studies) Ba3 `Community and Ecosystem Ecology´. Specific to `Limnology´ is its focus on physical and chemical (generally, abiotic) controls on the structure and productivity of aquatic communities, and on the role of aquatic biota in the functioning and nutrient budget of the local ecosystem.
The principal objective of `Limnology´ is to provide students with advanced insight in the structure and functioning of continental aquatic ecosystems of all major types and from all climate regimes worldwide.

Contents

1) Structure and function of continental aquatic ecosystems with equal attention to physical, chemical, and biological/ecological processes, and including basin hydrology. Physical limnology starting from first principles of basin morphometry, temperature, density stratification and wind strength. Chemical limnology with focus on redox conditions in the water column and on the lake bottom, and on nutrient balance with processes of input, loss, and recycling.

2) Elaboration of contrasts in the chemical and physical limnology of rivers, wetlands, lakes and ponds both in temperate Europe and in tropical, polar and high-mountain regions as determinants of local aquatic biology and ecology.
3) Advanced aquatic ecology with emphasis on the ecological role of diverse groups of aquatic biota; roles of stoichiometry, classic and alternative food chains in ecosystem functioning, and bottom-up vs. top-down controls on aquatic productivity.

Initial competences

Ba1 General Chemistry I and II; Ba1 Ecology; Ba3 Community and Ecosystem Ecology; Ba3 Aquatic ecology; or having acquired the relevant knowledge through personal study or by other means.

Final competences

1 Demonstrate advanced multidisciplinary insight in the physical, chemical, hydrological and biological functioning of lakes and rivers at the system level, applicable to continental aquatic ecosystems of all types and regions worldwide.
2 Show ability to sketch the biology (and her seasonal patterns) and dominant nutrient-cycling processes of any arbitrary lake from a limited number of physical and chemical field measurements.
3 Display critical insight in evaluating the relevance and applicability of data gained from laboratory and mesocosm experiments to ecosystem functioning in the real world.
4 Demonstrate ability to process, combine, evaluate, and synthesize in a structured manner complex information from the primary scientific literature of multiple relevant sub-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

Group work, Seminar, Lecture, Practical

Extra information on the teaching methods

Lectures: Recorded PPT presentations with figures and text
Practical exercises: 2 afternoon sessions of field- and labwork on measuring techniques for dissolved oxygen, acidity (pH), alkalinity and transparency (Oceans&Lakes students are exempt)
Seminar guided exercises: problem solving in applied limnology; quiz in class
Teamwork: analysis of data obtained in the practical exercises, reported on in a PPT presentation (Oceans&Lakes students are exempt)

Study material

Type: Handbook

Name: selected chapters of 'Limnology' (Pearson, 2002)
Indicative price: € 15
Optional: no
Language : English
Author : J. Kalff
ISBN : 0-130-33775-7
Number of Pages : 458
Alternative : pdf posted on Ufora
Online Available : No
Available in the Library : Yes
Available through Student Association : Yes
Usability and Lifetime within the Course Unit : intensive
Usability and Lifetime within the Study Programme : regularly
Usability and Lifetime after the Study Programme : occasionally
Additional information: Book out of print; cost is for hard-copy of treated chapters sold by GBK

Type: Slides

Name: Powerpoint presentations and recordings for 17 lectures
Indicative price: Free or paid by faculty
Optional: no
Language : English
Number of Slides : 450
Available on Ufora : Yes
Online Available : No
Available in the Library : No
Available through Student Association : No

References

Recommended primary literature on selected topics, posted on Ufora.

Course content-related study coaching

1 Moderation/supervision of exercises in which understanding of the theorical course material is tested through multiple-choice questions; and whether the student can demonstrate this knowledge in a practical lake-management application.
2 Supervision of practical exercises in which diverse methods of field measurements and laboratory analyses of dissolved oxygen, alkalinity, pH and transparency are made, and the reliability of these methods is tested with derived calculations (vrijstelling voor Oceans&Lakes studenten)

Assessment moments

end-of-term and continuous assessment

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

Written assessment with open-ended questions

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

Written assessment with open-ended questions

Examination methods in case of permanent assessment

Oral assessment, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

Non-periodical evaluation: content and form of PPT presentation produced from group task, including Q&A-session afterwards.
Periodical evaluation: the final exam tests knowledge as well as understanding of lecture material, problem solving on quantitative aspects of stratification, nutrient budget or aquatic productivity; on-campus closed-book written exam.
On-line exam is exceptionally possible with valid reason.

Calculation of the examination mark

Oceans & Lakes: end-of-term theory examination 100%
Biology and other programmes: end-of-term theory examination 75%; group work 15%, presentation and Q&A session 10%

Facilities for Working Students

1 Possible exemption from educational activities requiring student attendance
2 Possible rescheduling of the examination to a different time in the same academic year
3 Alternative time for feedback is possible

For more information concerning flexible learning: contact the monitoring service of the faculty of Arts and philosophy