GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Mathematics I (I610018)

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 2025-2026

A (semester 1)	Dutch	Kortrijk	lecture
			seminar
			independent work

Lecturers in academic year 2025-2026

Schelfaut, An	LA26	staff member
Van de Walle, Elien	LA26	staff member
Baetens, Jan	LA26	lecturer-in-charge
Mattheijssens, Joris	LA26	co-lecturer

Offered in the following programmes in 2025-2026	**crdts**	**offering**
Bachelor of Science in Bioindustrial Sciences	6	A
Linking Course Master of Science in Bioindustrial Sciences: Circular Bioprocesstechnology	6	A

Teaching languages

Dutch

Keywords

Sets, vectors, functions, continuity and limits, differentiation, integration, Taylor series, single variable calculus, Python.

Position of the course

This course provides the students with the tools and techniques that are needed to approach and solve engineering problems and to understand, analyse and describe biological, natural and productions processes. Such a solid mathematical background is needed in engineering disciplines, and is surely pervaded by differential and integral calculus. The focus of this course will be on problem solving from a pratical point of view, though a theoretical underpinning of the presented techniques, concepts and methods will be provided. Given the growing complexity of engineering problems and the omnipresence of computers, the students will also be introduced to numerical and symbolical calculations in Python. Theorems will be stated, but proofs will be omitted. In this way, emphasis lies on the practical use of the discussed methods.

Contents

Precalculus

1 Sets and numbers
2 Functions
3 Algebraic functions
4 Transcendental functions (exponential, logarithmic, (inverse) trigonometric and hyperbolic)
5 Vectors
6 Analytical geometry

Single variable calculus

1 Limits and continuity
2 Differentiation
3 Parametric and polar curves
4 Graphical behavior of functions

5 Integration
6 Applications of integration

Initial competences

Final competences of secondary school or equivalent.
Advise: required subjects in the curricula 'Mathematics' of the officially recognized educational networks in Flanders for programmes with at least 4 hours of mathematics training per week in the last two years of general secondary education (ASO) or at least 6 hours of mathematics training per week in the last two years of technical secondary education (TSO) are recommended.

Final competences

1 Have insight into the mathematical, geometric and physical meaning of functions of one variable.
2 Have insight into the mathematical, geometric and physical meaning of vectors, limits, derivatives, integrals, Taylor series, polar coordinates, and parametric curves.
3 Use vectors, functions of one variable, limits, derivatives, integrals, polar coordinates, and parametric curves.
4 Follow a reasoning regarding functions of one variable and act accordingly.
5 Work correctly and with mathematical precision with functions of one variable.

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, Lecture, Independent work

Extra information on the teaching methods

During the lectures important concepts and properties are introduced, which form the starting point for solving problems during the seminars.

Study material

Type: Syllabus

Name: Mathematics I and II
Indicative price: € 35
Optional: no
Language : Dutch
Oldest Usable Edition : 2023-2024
Available on Ufora : Yes
Online Available : No
Available in the Library : Yes
Available through Student Association : No

References

Hartman, G., Siemers, T., Heinold, B., Chalishajar, D., Bowen, J., APEX Calculus;
R. Adams and C. Essex, Calculus, a complete course

Course content-related study coaching

The lecturer answers questions concerning the theory upon appointment and before and after the lectures, the teaching assistants are available for questions related to the exercises and practical sessions, interactive support via the electronic learning platform.

Assessment moments

end-of-term and continuous assessment

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

Written assessment with multiple-choice questions, Written assessment with open-ended questions

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

Written assessment with multiple-choice questions, Written assessment with open-ended questions

Examination methods in case of permanent assessment

Written assessment with multiple-choice questions, Written assessment with open-ended questions

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

The exam consists of exercises and questions of a more theoretical nature.
The first continuous evaluation will take place at the end of weeks 6 or 7 and covers the following chapters: sets and numbers, functions, algebraic functions, transcendental functions, vectors and analytical geometry.

Calculation of the examination mark

June session

The final mark is calculated as a weighted average of the marks obatained through the period aligned (PE1) and non-period aligned (NPE) evaluations, with weighting coefficients of 5/6 and 1/6, respectively, unless the mark for PE1 is higher than the one for NPE, so
Final mark = 5/6 PE1 + 1/6 NPE, if PE1≤NPE,
and
Final mark = 5/5 PE1, if PE1>NPE

August session

The final mark is computed in the same was as for the June session, so
Final mark = 5/6 PE2 + 1/6 NPE, if PE2≤NPE,
and
Final mark = 5/5 PE2, if PE2>NPE
Students who eschew the non-period aligned evaluation for this course unit gets a 0 for the NPE score. Students who eschew the period aligned evaluation for this course unit will be failed