GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Mathematical Structures and Functions (C004203)

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

Credits 5.0 **Study time 150 h**

Course offerings and teaching methods in academic year 2025-2026

A (semester 1)	Dutch	Gent	lecture
			seminar

Lecturers in academic year 2025-2026

Vindas Diaz, Jasson	WE16	lecturer-in-charge
Baes, Maarten	WE05	co-lecturer

Offered in the following programmes in 2025-2026	**crdts**	**offering**
Bachelor of Science in Physics and Astronomy	5	A

Teaching languages

Dutch

Keywords

Functions of one real variable, differential calculus, integral calculus, linear differential equations

Position of the course

This course unit belongs to the learning pathway "Mathematics" in the Bachelor program Physics and Astronomy.
This course contributes to the goals of the bachelor study program by offering a well- founded and at the same time widely applicable introduction to functions of one real variable. It consists entirely of 'broad basic knowledge', and it supplies knowledge and skills that are indispensable in many domains of physics and astronomy. The theory is intrinsically linked to exercises aiming also at self-activity.

Contents

1. Introductory concepts and definitions
2. Number systems
3. Limits and continuity
4. Differentiability
5. Integration
6. Taylor series
7. Fourier analysis
8. Introduction to linear differential equations

Initial competences

Final objectives of secondary education.

Final competences

The student should be able to assess an elementary (theoretical or practical) problem of real analysis in one variable, e.g. originating from physics, to reason about its solution, and to find a solution via the learned methods.

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

Extra information on the teaching methods

Lectures, seminars: coached exercises.

Study material

Type: Syllabus

Name: Mathematical structures and functions
Indicative price: Free or paid by faculty
Optional: no
Language : Dutch
Number of Pages : 260
Available on Ufora : Yes
Online Available : Yes
Available in the Library : No
Available through Student Association : No

Type: Slides

Name: Mathematical structures and functions
Indicative price: Free or paid by faculty
Optional: yes
Language : Dutch
Number of Slides : 1000
Available on Ufora : Yes
Online Available : Yes
Available in the Library : No
Available through Student Association : No

References

Altland, A., von Delft, J., Mathematics for Physicists: Introductory Concepts and Methods. Cambridge: Cambridge University Press, 2019
Apostol, T. M., Calculus I. One-variable calculus, with an introduction to linear algebra. 2nd ed. New York (N.Y.): Blaisdell, 1967.
Spivak, M., Calculus. London: Benjamin, 1973.

Course content-related study coaching

Regular support by the appointed teaching staff during consultation hours and by available lecturers before and after classes.

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 evaluation in two parts, theory and exercises. In the theory part, knowledge and skills acquired will be tested, as well as the ability to interconnect different subjects. In the exercise part, the acquired skills will have to be applied.

Calculation of the examination mark

Periodic evaluation 100%.

Facilities for Working Students

All the presentations are available online for students that cannot attend the classes, and the lecturers are available for additional explanations.