

## 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	independent work	
			seminar	0.0h
			lecture	0.0h

### 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
<a href="#">Bachelor of Science in Bioindustrial Sciences</a>	6	A
<a href="#">Linking Course Master of Science in Bioindustrial Sciences: Circular Bioprosesstechnology</a>	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 practical 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:** minimum goals as stipulated in the curriculum 'uitgebreide wiskunde in functie van wetenschappen'.

### 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

### 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 lecturers answer questions concerning upon appointment.

### 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

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 obtained 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 =  $\frac{5}{6} \text{ PE1} + \frac{1}{6} \text{ NPE}$ , if  $\text{PE1} \leq \text{NPE}$ ,  
and

Final mark =  $\frac{5}{5} \text{ PE1}$ , if  $\text{PE1} > \text{NPE}$

**August session**

The final mark is computed in the same way as for the June session, so

Final mark =  $\frac{5}{6} \text{ PE2} + \frac{1}{6} \text{ NPE}$ , if  $\text{PE2} \leq \text{NPE}$ ,  
and

Final mark =  $\frac{5}{5} \text{ PE2}$ , if  $\text{PE2} > \text{NPE}$

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