

Course Specifications

Valid in the academic year 2023-2024

Mathematics I (E701033)

Course size	(nominal values; actual val	ues may depend on programme)			
Credits 6.0	Study time				
Course offerings and t	eaching methods in academic	year 2023-2024			
A (semester 1)	Dutch	Gent	eminar		
Lecturers in academic	year 2023-2024				
Van Hecke, Tanja	Van Hecke, Tanja TW05		lecturer-in-charge		
Tonesi, Cristina	TW05		co-lecturer	co-lecturer	
Offered in the following programmes in 2023-2024				offering	
Bachelor of Science in Engineering Technology(main subject Chemical Engineering Technology)				А	
Bachelor of Scier	ice in Engineering Technology(i	nain subject Civil Engineering Techno	ology) 6	А	
Bachelor of Scier Engineering Tech	nce in Engineering Technology(r Inology)	nain subject Electromechanical	6	А	
Bachelor of Scier Engineering Tech	nce in Engineering Technology(1 Inoloav)	nain subject Electronics and ICT	6	А	
Bachelor of Scier Technology)	ice in Engineering Technology(i	nain subject Information Engineering] 6	А	
Bachelor of Scier	ice in Engineering Technology (Joint Section)	6	А	
Linking Course M Automation)	aster of Science in Electrical En	gineering Technology(main subject	6	А	
Linking Course M Electrical Engine	aster of Science in Electrical En ering)	gineering Technology(main subject	6	А	
Linking Course M subject Electroni	aster of Science in Electronics a cs Engineering)	nd ICT Engineering Technology(mair	6	А	
Linking Course M subject Embedde	aster of Science in Electronics and Systems)	and ICT Engineering Technology(mair	6	А	
Linking Course M subject ICT)	aster of Science in Electronics a	and ICT Engineering Technology(mair	ı 6	А	
Linking Course M	aster of Science in Chemical En	gineering Technology	6	А	
Linking Course Master of Science in Civil Engineering Technology			6	Α	
Linking Course Master of Science in Electromechanical Engineering Technology			6	А	
Linking Course Master of Science in Information Engineering Technology			6	А	
Linking Course M	aster of Science in Land Survey	Engineering Technology	6	А	

Teaching languages

Dutch

Keywords

Complex numbers, vectors, analytical geometry, real functions of one variable, continuity, limit, differential calculus, integral, parametric curves, polar curves

Position of the course

The aim of the course is to provide insight into the theory and practice of essential mathematical concepts and methods related to complex numbers, real vectors, 3-dimensional analytic geometry, continuity, limits, differential calculus and integrals of one variable functions, parametric and polar curves. The treated subjects are primarily chosen in relation with the study programme.

Contents

- Complex numbers: different representations, calculation rules, Euler's formula, n-th roots, polynomial solving, applications.
- Vectors: representation, calculation rules, scalar product, vector product, scalar triple product, properties and applications.
- Classification of quadratic curves.
- 3-dimensional analytic geometry: classification of quadratic surfaces, spherical and cylindrical coordinates.
- One variable real functions: definitions and properties.
- Continuity, limits: definitions, theorems and applications. First and higher order derivative and differential: definitions, calculation rules, theorems and applications.
- Integration techniques, definite integrals and their applications.
- Polar curves, parametric representation of planar curves.

Initial competences

Mathematical knowledge from secondary school, as treated during the summer course mathematics.

Final competences

- 1 To have acquired insight in the mathematical, geometric and physical interpretation of the notions continuity, derivative, differential, integral
- 2 To have acquired insight in the different representations of planar curves
- 3 To have acquired insight in the mathematical, geometric and physical interpretation of notions from 2D geometry and 3D geometry
- 4 Being able to make computations with complex numbers
- 5 To have acquired insight in the mathematical, geometric and physical interpretation of vectors and being able to apply them on engineering problems
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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

Learning materials and price

- Lecture notes in Dutch (+/- 6 Euro).
- Slides available on the electronic learning platform.
- Additional learning material available electronically as tests that the students can make independently.

References

- Calculus, B. Thomas, Pearson
- Wiskunde voor het hoger technisch onderwijs, Lothar Papula, Academic Service
- Advanced Calculus, Murray R. Spiegel, Schaum's Outline Series

Course content-related study coaching

- Tutorial service
- The lecturer can be asked questions immediately after the lessons or by appointment or by means of Ufora

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 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

- First and second exam session: written, closed-book examination, without calculator.
- In between term evaluation: written, closed-book evaluation without calculator (only exercises) during the semester.

Calculation of the examination mark

First session:

Final score=max(0.2 x NPE + 0.8 x PE1, 0.1 x NPE + 0.9 x PE1) NPE=in between term evaluation (/20) PE1=exam first session (/20)

Second session:

Final score=max(PE2; 0.2 **x** NPE + 0.8 **x** PE2) PE2=exam second session (/20)