

Mathematical Tools in Engineering: Complex Analysis (E001820)

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

Credits	3.0	Study time	90 h	Contact hrs	30.0 h
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Course offerings and teaching methods in academic year 2018-2019

A (semester 1)	Dutch	seminar	15.0 h
		lecture	15.0 h

Lecturers in academic year 2018-2019

Constales, Denis	TW16	lecturer-in-charge
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Offered in the following programmes in 2018-2019

	crdts	offering
Bachelor of Science in Engineering Physics	3	A
Bridging Programme Master of Science in Engineering Physics	3	A

Teaching languages

Dutch

Keywords

Contour integration, holomorphic functions, summation of series

Position of the course

In-depth study of basic concepts from complex analysis to provide a sound basis for a number of courses of the bachelor and master in engineering/option physics.

Contents

- Cauchy theorem and formula
- Sequences and series of functions
- Laurent series, zeroes and poles, residue theorem
- Polynomials and rational functions
- Complex logarithm, branch points and cuts, power function
- Circular and hyperbolic functions and their inverses
- Limit theorems and contour integrals
- Summation of series
- Conformal mappings and harmonic functions

Initial competences

Mathematical Analysis I: Functions of One Variable, Mathematical Analysis II: Functions of Several Variables, Geometry and Linear Algebra

Final competences

- 1 Have insight into complex analysis and apply it creatively and purposefully within one's own engineering discipline.
- 2 Use current models, methods and techniques of complex analysis in assignments.
- 3 Precision, perseverance and being critical.
- 4 Use the terminology of complex analysis correctly.
- 5 Complete concrete assignments according to plan.

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

Lecture, seminar

Learning materials and price

Dutch syllabus distributed by VTK and additional course materials via Minerva.

References

see syllabus

Course content-related study coaching

The instructor can be contacted before or after the lectures, or by appointment.
Interactive support via Minerva.

Evaluation methods

end-of-term evaluation

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

Written examination with open questions

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

Written examination with open questions

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

Both theoretical and exercise part of the exam with closed book.

Calculation of the examination mark