EPFL

MATH-207(c)	**Analysis IV**

Licht Martin Werner

Cursus	Sem.	Type
Electrical and Electronical Engineering	BA4	Obl.
HES - EL	E	Obl.
HES - GM	E	Obl.
Materials Science and Engineering	BA4	Obl.
Mechanical engineering	BA4	Obl.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	Written
Workload	120h
Weeks	14
Hours	**4 weekly**
Lecture	2 weekly
Exercises	2 weekly
Number of positions	

Summary

This course is an introduction to the theory of complex analysis, Fourier series and Fourier transforms (including for tempered distributions), the Laplace transform, and their uses to solve ordinary and partial differential equations.

Content

Complex analysis
- Definitions and examples of complex functions.
- Holomorphic functions.
- Cauchy-Riemann equations.
- Complex integrals and Cauchy formulas.
- Series of Laurent.
- Residue theorem.

Laplace's analysis
- Laplace transforms.
- Applications to ordinary differential equations.
- Applications to partial differential equations.

Learning Prerequisites

Required courses

Linear Algebra, Analysis I, Analysis II, Analysis III

Important concepts to start the course

Important concepts to master
- Usual derivatives and derivation rules
- Common primitives and integration techniques (IPP, substitution)
- Taylor series and analytic functions
- Complex numbers (definitions, Euler's identity, complex exponential)
- Fourier series and transforms
- Linear differential equations

Assessment methods

Exam written

Resources

Bibliography

Bibliographie
B. Dacorogna et C. Tanteri, Analyse avancée pour ingénieurs, PPUR 2018.

Ressources en bibliothèque

- Analyse avancée pour ingénieurs / Dacorogna

Moodle Link

- https://go.epfl.ch/MATH-207_c