Analysis IV - Introduction

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Welcome to Analysis IV - MATH-207(d) !

Organizational outline

- Weekly lectures: Thursday 15:00-17:00
- Weekly exercises: Thursday 17:00-19:00
- Exercise sheets published weekly on Mondays

Prerequisites

- A solid understanding of Analyse I & II.
- Fourier analysis as in Analyse III.
- Familiarity with sequences and series, continuity, derivatives, integrals.
- Basic knowledge of linear algebra (vectors) and topology (open sets) is helpful.

Course Content Outline

- **Part 1: Complex analysis**
  - Holomorphic functions, Cauchy–Riemann equations
  - Complex integrals
  - Laurent series
  - Residue theorem
- **Part 2: Applications**
  - Laplace transform
  - Fourier series and Fourier transform (review)
  - Applications to (partial) differential equations

Course Materials

- Textbook *Bernard Dacorogna, Chiara Tanteri: Analyse avancé pour ingénieurs.*

Expectations and Guidelines

- Regular attendance and active participation in lectures and exercises.
- Collaboration for exercises is encouraged
- The exercises cover the material of the prior week

Communication and Support

- Course announcements will be posted on the website.
- Email the instructor for personal inquiries or to schedule appointments.

Final Exam

- Prospectively first Tuesday of the first exam week, in the morning
- Comprehensive, covering all course materials.
- Cheat sheet: physical paper, two-sided, hand-written or printend, any content
- ca. 60% multiple choice, ca. 40% open questions
- Mostly common exam for all Analysis IV classes for scientists/engineers (Moschidis, Licht, Zemel)

Preparation Tips:

- Start early and review all course materials.
- Practice sample problems from the textbook.
- Form study groups for discussion and problem-solving.