

Basic graduate courses

Aims

- ▶ Consolidate and deepen the knowledge acquired from bachelor-/master courses.
- ▶ Ensure that all graduate students gain a broad *general* knowledge of (pure and applied) mathematics.
- ▶ Fill certain learning gaps from bachelor-/master courses.
- ▶ Facilitate mathematical discussions between graduate students in different fields.

Basic graduate courses

ROUGH PLAN: Create 1-2 graduate courses (7,5 hp each), which

- ▶ run every second year.
- ▶ have rotating lecturers (appropriate hour compensation).
- ▶ flexible syllabus.
- ▶ could potentially start already next year.

PRELIMINARY SUGGESTION:

Course A: *Analysis* (real-/complex-/Fourier-/functional-).

Course B: Not yet clear, but something geared towards "Geometry" (vector bundles, connections, etc).

Course A: Analysis

One option is that the course material roughly covers Chapters 1-16 in Rudin's book

"Real and Complex analysis",

but the exact syllabus should be allowed to vary with the lecturer.

AIMS:

- ▶ Consolidate theories and techniques covered in the bachelor/master courses in real and complex analysis, Fourier and functional analysis (including distribution theory and operator theory).
- ▶ Cover additional topics, for instance: conformal mappings and uniformization, Sobolev spaces, oscillatory integrals, various integral transforms, etc.

PREREQUISITES: All (or at least most of) the bachelor-/master courses in analysis.

Course B: Geometry

Note: This is a much more preliminary version than Course A

Based on suggestions and remarks from colleagues, we believe that there could be an interest in a course which consolidates, and expands upon, the bachelor-/master courses in geometry (of manifolds):

MMG720 (Differential geometry) and **MMA211** (Högre differentialkalkyl).

AIMS:

- ▶ Consolidate theories and techniques related to basic manifold theory.
- ▶ Cover additional topics, for instance: Riemannian geometry (including vector bundles, connections etc), hyperbolic geometry, etc.

Questions:

For the discussions:

- ▶ What should Course A and Course B cover?
- ▶ Should these courses be compulsory? (and if so, for whom)?
- ▶ Who will teach these courses (how do we "select" lecturers)?
- ▶ How many hours/week? (Master courses: usually 2-3 meetings/week).
- ▶ Examination format?