Raising Expectations:
First-Year Curriculum Development in Mathematics

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Fundamental Issues

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- … and important material missing
- Students don't engage in exercise classes

Changes to First-Year Teaching

- Mathematical Structures, a new module

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  - Graduates will be self-aware and responsible learners
  - Graduates will communicate effectively with a range of audiences
  - Graduates will be able to extend their understanding through academic enquiry
  - Graduates will be able to use information constructively and critically

MTH4110 Mathematical Structures

"This module is intended to introduce students to the concerns of mathematics, namely clear and accurate exposition and convincing proofs. It will attempt to instill the habit of being 'precise but not pedantic'. The course covers an informal account of sets, functions, and relations, and a sketch of the number systems (natural numbers, integers, rational, real and complex numbers), outlining their construction and main properties."

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- Complex numbers. The complex plane with Cartesian and polar coordinates; addition and multiplication. Statement of the Fundamental Theorem of Algebra.

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And most importantly:

- This module is compulsory for ALL study programmes

First-Year Modules

Semester 1:

- Calculus I
- Mathematical Structures
- Introduction to Probability
- *Mathematical Computing*

Semester 2:

- Calculus II
- Geometry I
- Introduction to Statistics
- *Introduction to Algebra*

Six modules are compulsory across *all* study programmes

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- LG11 has Mathematical Methods 1/2 instead of Calculus I/II and Geometry I

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Writing becomes part of all coursework (together with removal of "starred" question)
Presenting/Critiquing will be piloted in Mathematical Structures

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Suggested

- No penalties for non-engagement during pilot

Raising Expectations

Creating a different first-year student experience requires

- Setting and enforcing standards
- Communicate this regularly and repeatedly to students
- Provide training to (all!) exercise class helpers
- Encourage regular meetings of first-year lecturers

External's Views

Comments

- All seems very sensible
- Fully support the proposed measures
- New module looks good and coherent
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Questions

- How are you going to improve attendance?
- How are the courseworks assessed?
- How do you deal with students that don't do a presentation?

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