

Supporting students without A-level maths

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What is the problem?

- Not all STEM courses at Lancaster University require A-level mathematics widening participation policy.
- Environmental Sciences and Chemistry do not require A-level mathematics the minimum GCSE requirement for maths is a grade of 5.
- **Engineering** admits students with BTEC in "an Engineering related subject". The minimum GSCE requirement for maths is a grade of 6.
- Some students come from **abroad** or are **mature** students.

Case study A

"Paula" – a mature first year student in Environmental Science

Paula's level of mathematics

- Paula has achieved a B in GCSE mathematics 10 years ago.
- Struggles to do basic algebra – e.g. cannot rearrange equations.
- No knowledge of indices.
- Struggles to do basic arithmetic with fractions.
- Lacks basic arithmetic skills

 e.g. does not differentiate
 between (5 1) and 5 × (-1)

Level of maths modules

- Simultaneous equations
- Trigonometry
- Differentiation
- Integration
- Numerical methods for integration

Case study B

"Mark" – a first year student in Engineering

Mark's level of mathematics

- Mark has done a **BTEC** in Engineering.
- Failed all first year maths modules and is repeating the year.
- Struggles to do basic algebra – e.g. can't rearrange equations without guidance.
- Struggles to do algebra and arithmetic with fractions – e.g. thinks that $\frac{1}{a+b} = \frac{1}{a} + \frac{1}{b}$.
- Has no knowledge of functions and how to graph a function.

Level of maths modules

Complex Numbers

- Limits, Series and Sequences
- Advanced Calculus
- Linear Algebra matrices and vectors
- Fourier Series
- Differential equations

Solutions

What has been done?

- We offered:
 - Additional maths workshops for Environmental and Engineering students
 - General workshops covering GCSE and A-level topics
 - Weekly Drop-in Sessions
 - **One-to-one** tutorials covering year one topics

What more can be done?

- Department cooperation
- Additional Funding
- Suggestions:
 - A foundation year
 - A crash course in algebra
 - Timetabled/compulsory workshops
 - Additional one-to-one support to cover the gaps in knowledge

Thank you!

Questions?