Coping with the mathematics problem

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What is the mathematics problem?

- Fewer candidates
- Lack of basic knowledge and skills
- Shortage of qualified teachers

AS and A level in turmoil

- The AS disaster
- Knock-on effects
- Waiting for revisions

How deep-rooted are the causes?

- GCSE grade B with little algebra
- Too much of a gap to A level
- Poor grasp of basic mathematics

Will things get better?

- Not before they get worse
- Not for some time
- Perhaps not for the foreseeable future

Why does it matter?

- Mathematics is the language of engineering?
- Engineering can be descriptive or analytical
- There are software packages
- “I never used much of the mathematics which I learned at university.”

Is there an irreducible core of mathematics for engineers?

- Will engineering courses have to change?
- Is there an **acceptable** minimum core?
- What is taught requires time

Mathematics in context

- Why does it matter?
- Will it hang together?
- Who can teach it?

JIT mathematics

- Have we learned nothing from GNVQ?
- Without coherence, mathematics is a box of tricks
- How can we ensure no overlap, no lacunae, no contradictions?

How we might proceed - 1

- Teach first semester engineering modules in a qualitative manner
- First semester mathematics will allow catch-up
- Then revisit engineering topics quantitatively

How we might proceed - 2

- Involve the mathematics lecturer as part of the teaching team
- Plan a coherent development of mathematics through the course
- Seek actively to provide joint case studies

Epilogue

- Mathematics requires time for its assimilation
- Short cut equals short change
- People who are weak mathematically need longer than those who are strong mathematically
- The interests of the students should be paramount