

## Background and aims

The Scottish mathematical sciences departments have a history of collaborative graduate training going back to the first Edinburgh Mathematical Society postgraduate conference in 1995 (these popular events at The Burn, near Edzell, are now held annually). Since then we have also initiated a comprehensive joint programme of mathematically relevant generic skills, paid for by institutional Roberts' funds. But we still did not realise exactly what we had let ourselves in for when we were awarded an EPSRC grant to set up the Scottish Mathematical Sciences Training Centre (SMSTC)! It is one of the six Taught Course Centres funded by EPSRC's Mathematical Sciences Programme (a full list is available at [www.epsrc.ac.uk/ResearchFunding/Programmes/Maths/Training/Courses.htm](http://www.epsrc.ac.uk/ResearchFunding/Programmes/Maths/Training/Courses.htm)) to address the issue raised in the 2004 International Review of UK Research in Mathematics that "new PhDs from the UK usually have less breadth and experience than their peers from other countries". The SMSTC's remit is to address this by providing broad courses for first-year PhD students in fundamental areas of mathematics and statistics. It is a collaborative venture with lectures taught 'live' by video-conference, and this article is a brief description of our first year of operation.

## Teaching and topics

The SMSTC's portfolio consists of eight six-month streams (in algebra, geometry and topology, pure analysis, applied analysis and PDEs, applied mathematics methods, mathematical modelling, probability, and statistics), each equivalent to a workload of about 25% of a student's time. The aim is to provide a broad training which complements the more specialised courses that are already available. A typical student registers for three streams, leaving about 25% of their time to work with a research supervisor during their first six months. Each stream is self-contained, and consists of a team of people who are responsible for producing comprehensive printed course notes, and delivering the lectures. These are two hours long and are held weekly by video conference. Individual departments are also expected to provide students with local tutorial sessions to help promote understanding and reinforce the lecture material. Each stream sets its own assessment: the aim is to ensure that the students actually learn something, and it typically involves a small number of assignments for the students to work on. Student performance was generally very good, with most scoring A or B grades.

## Student meetings

The SMSTC was launched with a two-day student symposium in October 2007. The meeting featured a short 'taster' lecture from each of the eight streams, to provide information on the topics covered and allow the students to ask questions about prerequisites, content and assessment etc. (although, as was stressed at the time, some details were yet to be finalised). Interspersed with these were sessions covering introductory generic skills. The social highlight was an excellent dinner at a local restaurant, which both staff and students enjoyed. A second half-day symposium was held in February 2008 in Edinburgh, and consisted of generic skills talks and an SMSTC discussion forum, at which the students provided useful feedback on their experience so far. This was followed by a wonderful lecture by Simon Singh on *Fermat's Last Theorem* – Maths in the Media, and a wine reception. As well as being enjoyable and useful events in their own right, we hope that the symposia will help students to become (and feel) part of the mathematical sciences community.

## Technical equipment

Delivery of lectures by video-conferencing (VC) was the only feasible option, since otherwise either staff or students would have needed to travel (possibly large distances) to give or attend lectures. The SMSTC departments have a large number of leading experts across the mathematical sciences, and teaching by VC allows this collective expertise to be available to all registered students. We chose to use standard (H.323-compliant) VC equipment because it is already in widespread use and allows free multi-site connection over the UK academic internet.

## Management and administration

An Academic Steering and Management Group is responsible for the overall management of the SMSTC and ensuring academic quality. It is convened by the Director, Tony Carbery (University of Edinburgh), and has representation from each contributing university and broad subject area, and external advisors. Non-scientific organisation and administration for the SMSTC is undertaken by staff at the International Centre for Mathematical Sciences (ICMS), one of the two EPSRC-funded mathematical research institutes in the UK.

## Website

The SMSTC's website ([www.smstc.ac.uk](http://www.smstc.ac.uk)) is an important communication channel. It is wiki-based and extremely easy to use, and has been popular with both staff and students. Students are given read-only logins and use the site to obtain general information (on symposia, assignments etc.) and to download PDFs of the comprehensive lecture notes before each lecture. Staff in 'stream teams' all have edit permission for their pages, which enables them to upload lecture notes and any other material themselves, without needing to go through a web administrator.

## Future

Plans are already well under way for the next session. The SMSTC's academic year will again open with a symposium (8–9 October 2008), with lectures running for nine weeks from 13 October, and resuming after a Christmas break on 12 January. We welcome enquiries (to Johanna Kytöharju, [johanna.kytoharju@icms.org.uk](mailto:johanna.kytoharju@icms.org.uk)) from anyone outwith the partner departments who would be interested in finding out more about the SMSTC, or registering for the next or future academic years. We charge a registration fee to partially cover the staff costs of lectures and administration associated with the SMSTC, but would be happy to arrange a free sample lecture for anyone interested.

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Adrian Bowman (University of Glasgow and leader of the SMSTC Statistics stream) gives a VC lecture, with students from a remote site shown in the background.