The Scottish Mathematical Sciences Training Centre

The participating universities are:

Edinburgh (lead)
Glasgow
Strathclyde
Heriot-Watt
Aberdeen
St. Andrews
Dundee

The Scottish Mathematical Sciences Training Centre

There are 8 streams covering

- Algebra

- Geometry & Topology

- Pure analysis

- Applied analysis and PDE's

- Applied mathematics methods

- Mathematical Modelling

- Probability (leader: Stan Zachary)

- Statistics (leader: Adrian Bowman)

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Each stream involves 20 2-hour lectures by videoconference, with supporting local tutorials. This represents 20 credits and around 200 hours of student effort.

1st year students are expected to take three streams (but Statistics is an exception because of the APTS scheme).

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There are four main aims of the Statistics stream.

(a) The consolidation of standard statistical concepts and methods. (Some students pursuing PhD topics in Mathematics may wish to attend.)

(b) An introduction to some key topics which lie at the heart of research in statistical methods.

(c) The development of good quality computational skills using R.

(d) The promotion of skills in the statistical analysis and reporting of real applications.

Statistics stream outline

Introduction to R (1)
Reviews of linear models (2), Likelihood & optimisation (2), GLMs (2)
Simulation and bootstrapping (2)
Random effects models (2)
Modern regression (2)
An Introduction to MCMC Methods (5)
Case studies (2)

Assessments – short projects after each block of 5 sessions.

The course material was prepared and delivered by

Adrian Bowman, University of Glasgow
Ruth King & Steve Buckland, University of St.Andrews

Probability stream

Foundations
Conditional expectation and martingales (discrete parameter space)
Markov processes (countable state space)
Stochastic modelling and simulation
Brownian motion and elements of stochastic calculus

Assessment: 3-4 homework assignments evenly spaced throughout the course.

Material prepared a delivered by a team led by Heriot-Watt.

Statistics stream outline

The videoconference medium has worked (surprisingly!) well.

The early part of the Statistics stream (regression, likelihood, glms, bootstrapping, simulation) could provide useful preparatory material for students attending APTS or other training courses.

In particular, it could provide an introduction to R, as all the material is taught with strong links to R.

Remote participation is feasible for those with access to videoconference equipment, or as distance learning for those who do not. There would be a (small) charge under the SMSTC scheme.

Please let Adrian Bowman know of any interest in this.