BSP: Structured projects in mathematics

Note that this course is a merged version of the previous BEE and BSP options

This double credit option is designed to help you understand mathematical research problems, and to learn some of the necessary techniques involved. We hope that it will help you to develop skills that will be useful to any future career: understanding new problems; working with new people; carrying out numerical computations where appropriate; making oral presentations; independent study and time management.

We will offer some projects (places will be strictly limited due to supervisor availability) and in addition students may find their own project and supervisor and submit a proposal for approval. **Due to limited places, you are advised to apply for BSP on time, and not to assume that you have a place until it has been confirmed.**

You will be expected to:
(a) Learn about a current research problem from relevant research papers.
(b) Carry out the required calculations if necessary, using MATLAB, Python or other suitable software.
(c) Write up the problem and your findings.
(d) Undertake peer review.
(e) Give an oral presentation to a non-specialist audience.

We are still finalizing our projects for 2024-2025 but hope to offer projects on topics which might include:
Diffusion Limited Aggregation
Fractal Sets and Measures
Gaussian Fields
Modelling HPV
Numerical Linear Algebra
Thermohaline Circulation

Previous BEE topics have included:
Application of Diffusion Models in Bioinformatics
Equidistribution Estimates and Fractional Parts of Polynomials
Proof Theory and Diagrammatic Reasoning
The Isoperimetric Inequality

Michaelmas Term
There will be a group meeting with the course organizer, Cath Wilkins, at the beginning of MT and individual meetings with her at the end of MT. Between those times you will be expected to read around your chosen topic, learn LaTeX, complete a practice peer review, and make a start on your project. You will also meet with your specialist supervisor at the start and end of term.

Hilary Term

Week 1:	Lecture on key skills, dissertation writing and the structure of the term.
Weeks 1-8:	Each student to meet regularly with specialist supervisor.
Weeks 7-8:	Help with presentations, including a mock presentation.
Monday Week 10:	Submission of written report.
Easter vacation:	Peer review.

Trinity Term

Week 1:	Oral presentations.

Students have sometimes expressed doubts about the predictability or reliability of project assessment. We are therefore concerned (i) to make the assessment scheme as transparent as possible and (ii) that students who produce good project work should be able to achieve equivalent grades to students who write good exam papers.

The mark breakdown will be as follows: Written work 75%, Oral presentation 15%, Peer review 10% (these marks go to the reviewer for their assessment; they will NOT affect the mark of the reviewee, whose work will already have been graded by the examiners in the usual way).

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