

## **BSP: Structured projects in mathematical modelling and numerical computation**

This double credit option is designed to help you understand applications of mathematics to current research problems, and to learn some of the necessary techniques. 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; making oral presentations; independent study and time management.

**Places on this course are strictly limited, due to supervisor availability, and so you are advised to apply 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 using MATLAB or other suitable software.
- (c) Write up the problem and your findings.
- (d) Give an oral presentation to a non-specialist audience.
- (e) Undertake peer review.

We are still finalizing our projects for 2022–2023 but hope to offer projects on topics which might include:  
Diffusion Limited Aggregation,  
Machine learning methods for predicting health outcomes,  
Modelling Infectious Diseases, specifically COVID-19 modelling in the UK,  
Numerical Linear Algebra,  
Numerical Approximation,  
Random Plane Waves.

Synopses for last year's projects can be found on the BSP website as a guide to what to expect for this year.

### *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 and MATLAB, complete a practice peer review, and make a start on your project. Regular individual contact with the organizer by email, or if necessary in person, will be encouraged. You will also meet once with your specialist supervisor towards the end of term.

### *Hilary Term*

Week 1: Lecture on key skills, dissertation writing and the structure of the term.  
Weeks 1, 3, 5, 7: Each student to meet 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).

Cath Wilkins [wilkins@maths.ox.ac.uk](mailto:wilkins@maths.ox.ac.uk)