

## Engineering Tripos Part IIA Project, GD6: Surveying, 2017-18

### Leader

[Mr A L Johnson](#) [1]

### Timing and Structure

Thursdays 2-6pm, Mondays 9-1pm plus afternoon and Wednesdays 2-6pm

### Prerequisites

None

### Aims

The aims of the course are to:

- To familiarise students with the use of the principal surveying instruments: total stations (including reflectorless), levels, and GNSS (Global Navigational Satellite Systems).
- To introduce the main techniques of field survey (traversing, levelling, resectioning, point fixing, detail collection and setting-out) and of survey management (planning, adjustment, projection and mapping).
- To show how geographical considerations affect the planning of civil engineering constructions.
- To familiarise students with aspects of the construction process.

### Content

This project introduces students with no previous surveying experience to the techniques of modern survey under near-realistic conditions. As well as being essential technical knowledge for any student who has an interest in any area of civil engineering, the course illustrates many of the problems and issues which are faced by engineers whenever accurate and reliable measurements have to be made under adverse conditions. A basic introduction to river modelling is also included in the project.

Those students who have already been introduced to basic surveying through the Extension Activity in Part IIA should choose Project GD5.

### FORMAL

- In Exercise 1, students will join the GD5 students to study basic river modelling methods and flood risk management strategies.
- In Exercise 2, students will be introduced to field survey techniques.
- In Exercise 3, students will plan and create their own network of control points for point-fixing, mapping and setting out.

Students work in groups of three (and for some parts, in groups of six) for Exercises 2 and 3, and each group is responsible for collecting and analysing its own data. Assessment will be based on the quality of work and results achieved in the field, as well as reports describing the work which has been done

## Week 1

Introduction to river modelling and calculation of water surface profiles in steady flows (exercise 1); basic use of surveying instruments, and techniques (exercise 2).

## Week 2

Complete exercise 2, then site reconnaissance and planning.

## Week 3

Traverse, detailing, point fixing and levelling (exercise 3).

## Week 4

Adjustment, mapping, setting out and final report.

## Coursework

Coursework	Due date	Marks
Exercise 1	Wednesday 23 May 2018	10
Exercise 2	Monday 28 May 2018	25 (10 for group and 15 for individual)
Final report	4pm, Thursday 7 June 2018	45 (20 marks for group and 25 for individual)

## Examination Guidelines

Please refer to [Form & conduct of the examinations](#) [2].

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## Links

[1] <mailto:alj3@cam.ac.uk>

[2] <https://teaching22-23.eng.cam.ac.uk/content/form-conduct-examinations>