# Part IA registration and start of year course information

This section contains information about special arrangements for the first few days of the Part IA Engineering course, as well as guidance for the rest of the year. All the documentation you will need for the course is available on the undergraduate teaching website; these briefing notes should help you to learn how to navigate the site.

You will at Registration receive hard copy of the 'Freshers' Guide' produced for you by students: it is available on-line here.

**Table of contents**


- Registration timetable
- Essential equipment
- Introductory Lectures
- Study skills afternoon
- Health and safety at work lectures
- Where are the lecture rooms/theatres?
- Coursework and labs in your first week
- How to read the lecture card
- How to read the lab and coursework rota
- Preparing for the Week 1 Lego Mindstorms exercise


## Registration timetable

## Registration day: Tuesday 4 October 2016

Registration takes place in the Department of the main (Baker) building of the Engineering Department, in College groups. **All students** (Part IA plus exchange students and those transferring to any Part of the Tripos from other Departments) should register in accordance with the schedule below:

| College | Time | College | Time |
|---|---|---|---|
| CAI: | 10.40 | K: | 11.10 |
| CC: | 9.45 | LC: | 9.55 |
| CHR: | 9.00 | M: | 11.35 |
| CHU: | 14.20 | MUR: | 11.25 |
| CL: | 9.25 | N: | 11.15 |
| CTH: | 14.10 | PEM: | 10.55 |
| DOW: | 9.55 | PET: | 11.45 |
| ED | 9.10 | Q: | 12.00 |
| EM: | 10.05 | R: | 15.10 |
| F: | 15.35 | SE: | 14.45 |
| G: | 10.25 | SID: | 14.35 |
| HH: | 11.25 | T: | 14.55 |
| HOM: | 9.35 | TH: | 15.15 |
| JE: | 15.25 | W: | 11.25 |
| JN: | 9.15 | | |

The Registration will take place in two rooms this year. You will start in Lecture Room 4 (for photographs, drawing equipment, databooks) and finish in the Drawing and Project Office (DPO) where you will be asked to enter your registration details on a computer terminal and to complete an 'Application for Access to the Teaching Equipment' form. You will need your CRSid and Raven password. NB you will be unable to log on to the CUED Teaching System until about a day after you have registered. (MIT students should already have registered as part of their Orientation on Thursday 29 September 2016). You should note the guidance about the Department's computer

system.

**Notify staff if you are not a first year student, telling them whether you are an incomer or an exchange student.**

Your CUED record card and photograph will be held in the Teaching Office and details (eg courses taken, exam results etc) will be added as you progress through the course. The image will be used for Departmental records and identification. See related information about access and ID cards.

---

## Essential equipment

**NEW FOR 2016**: The purchasing of the essential equipment will now be done online (either in advance of, or during the registration process on Tuesday 4 October). The total cost of all items will be £43.06, you will be able to choose what is required as the sales process is split into three categories - full set of databooks, full set of drawing equipment and a calculator (Casio fx-991ES).

If this is done in advance you must remember to bring email confirmation of the purchase and you will be able to pick up your purchases at registration.

**NB.** After registration day a full set of drawing equipment (see below for individual items), a full set of databooks (see below for individual replacement books) and calculators (fx-991-ES) should be paid for online and collected from the IT Helpdesk in the DPO.

### Databooks

Databooks can be purchased for £10 as a complete set in a Shell UK ringbinder, usually at Part IA registration. Databooks are needed for all four years. Replacements cost £2 per booklet (cash). and can be obtained from the Teaching Office.

### Drawing equipment

A set of drawing equipment can be purchased for £16.50, usually at Part IA registration. Replacement items will be able to be purchased separately (with cash) from the Computer Operators once registration is over, the items are individually priced as follows:

- 2H pencil and plastic eraser (90p)
- acrylic ruler (£3.00)
- pair of large spring bow compasses (£8.10)
- radius aid (£2.00)
- geo-liner (combined set square and protractor) (£1.00)
- erasing shield (£1.50)

### Calculator

A suitable calculator (Casio fx-991ES) can be purchased for £16.56 . Note that you must have a calculator that conforms to the regulations for use in exams

---

## Introductory Lectures

## Introductory Lectures Wednesday 5th October 2016, 9.15–12.30 in LT0

**All first year students must attend these lectures. Incomers into other years are more than welcome.**

---

You will be issued with a folder containing general information, coursework instruction documents and the Freshers Maths Quiz.

| | | |
|---|---|---|
| 09.15 | Welcome to CUED | Prof David Cardwell, Head of Department |
| 09.30 | Aims of the Engineering Tripos | Dr Claire Barlow, Deputy Head (Teaching) |
| 09.40 | Laboratory work / Maths Quiz | Dr Stuart Scott |
| 10.00 | Week 1 Lego exercise | Dr Graham Treece |
| 10.05 | Library introduction / Data Protection Act | Ms Niamh Tumelty |
| 10.15 | Student questions | |
| 10.20 | Staff Student Joint Committee | Geoff Ma, Talay Cheema and Ben Merrett |
| 10.25 | Accreditation | Dr Chris Burgoyne |
| 10.35 | Industrial Experience requirements | Mrs Vicky Houghton |
| 10.45 | Language programme | Mr David Tual |
| 10.55 | Outreach Opportunities | Ms Maria Kettle |
| 11.05 | break for coffee | |
| 11.45 | Health and Safety Talk | Mr Ian Slack |

## Study skills afternoon

## Wednesday 5 October 2016, 2–3.30 pm in LT0

You are encouraged to attend the Study Skills afternoon, the programme for which is as follows:

| | | |
|---|---|---|
| 2.00pm | Lectures and Supervisions | Dr Alexandre Kabla |
| 2.45pm | Balancing Priorities | University Counselling Service |
| 3.05pm | Time Management | Dr Alexandre Kabla |

The presentations are available here.

## Health and safety at work lectures

All new and incoming students to Engineering **must** attend this lecture which takes place at 11.45-12.15 on Wednesday 5 October 2016 in LT0. **Attendance will be registered.** Any late incomers should attend the repeat of this talk on Wednesday 12 October 2016 at 1pm in LT0.

## Where are the lecture rooms/theatres?

LT0, LR4: ground floor Baker building

LR5, LT6: first floor Baker building

LT1, LT2: ground floor Inglis building

LR10, LR11, LR12: ground floor Baker South Wing

LR3, 3A, 3B: up steps in Inglis building

See also the SSJC map of the Engineering Department

## Coursework and labs in your first week

In the first week of term you work on a Lego Mindstorms project and you will start the exposition course. Other laboratory activities start in the second week.

### Lego Mindstorms

Part IA coursework starts with an intensive, hands-on activity using Lego Mindstorms. You work in groups of three on an open-ended and fun activity to design and build a simple electro-mechanical device. There are ten timetabled hours in the lab & coursework schedule, but you may wish to allow extra time during the evenings and weekend. The Lego lab handout (issued at the introductory lecture) includes instructions on how to sign on to Moodle afternoon of Wednesday 6 October.

### Exposition

The communication of technical information is developed through the exposition course which aims to improve students' presentation, discussion and writing skills. You will work with your group leader and the other students on a range of exercises, including writing a lab report and giving a technical talk. Exposition classes often take place in Colleges rather than the Engineering Department.

The list of exposition leaders and session locations is available on the Moodle Exposition site.

## How to read the lecture card

## How to read the lab and coursework rota

## Preparing for the Week 1 Lego Mindstorms exercise

In your first week at Cambridge, you will get a flavour of real-world engineering through the medium of Lego Mindstorms NXT. Not only will it be fun, but you will also begin to appreciate the many challenges inherent in engineering system design, from gear backlash to structural rigidity and automatic control. At this stage, you will need to come up with *ad hoc* solutions to these challenges. In due course, you will accumulate the expertise that will allow you to tackle such problems in a more disciplined manner.

The exercise will require you to demonstrate teamwork and communication skills. You will also be introduced to a programming language called Matlab, which you will use to control your Lego Mindstorms system. Matlab is a powerful numerical programming environment that many engineers find invaluable. It has much in common with the Python programming language that you will be taught during your first year.

To help you hit the ground running, here are some things you should do before arriving at Cambridge.

- **Watch some YouTube movies**. Go to www.youtube.com and search for Lego NXT. Spend some time admiring the amazing things that people have done with Lego, from Rubik's cube solvers to walking bipeds to bridge-laying robots to Segways. See what you can find out about the common components of these

Lego systems: the NXT programmable brick, motors, sensors, structural Lego pieces (both studded and pin-jointed) and kinematic mechanisms (e.g. gear trains).

- **Get a feel for the structure of the exercise.** You will discover your team allocation and schedule following departmental registration, just two days before the project starts. There are three students to a team and schedules will include afternoons: bear this in mind before making other arrangements.

| Week 1 | | | | | | Week 2 |
|---|---|---|---|---|---|---|
| Thursday | Friday | Weekend | Monday | Tuesday | Wednesday | Thursday Friday |
| Session 1 | Session 2 | | Session 3 | Session 4 | | Session 5 |
| Preliminary experiments | Design and build a Lego NXT system that demonstrates some aspect of engineering science | | | | Prepare presentations | Presentations |

In the first session, you will work through some highly structured exercises that introduce you to the Matlab programming environment and the various Lego sensors and actuators. The bulk of the activity occupies the next five days, when you will design and build a Lego system *that demonstrates some aspect of engineering science*. So no simple robots that just drive around and are little more than toys: we want you to do some real engineering! You might pick up some ideas from the web, you might have your own ideas, or you might like to try one of the projects we suggest. There will be prizes for the best systems, which will be showcased in a special lecture in week 2.

- **Read everything** at **http://mi.eng.cam.ac.uk/IALego/**. This includes details of the supplied Lego equipment, a tutorial on Lego gears, and some suggested projects. Apart from the Matlab programming details, all the projects should be understandable with some effort.
- **Optional — play with Lego.** If you have easy access to any Lego Technic, spend some time playing with it. Practise building simple structures and mechanisms.
- **Think about what Lego system you would like to build.** This might be one of the suggested projects, a variation of something you have seen on the web, or your own idea.