



Academic Interviews for Engineering

Engineering applicants will have two subject interviews each lasting about 25 minutes.

For the first subject interview (usually conducted with Dr Hynes), Please pick **one** of the problems listed below, and be prepared to solve it and discuss it during the interview.

Problem 1: A refrigerator is 60 cm wide, 60cm deep and 1m high. The door is opened and the cold air inside is replaced with kitchen air of temperature 25 °C. Estimate the pressure of the air inside the refrigerator an hour after the door is closed.

Estimate the force necessary to apply to the handle in order to open the door.

Problem 2: N friends develop an app and start a new free social media service, which others join at a rate αx , where x is the number who are already signed up and α is a constant. Those who are members can upgrade, for a fee, to enhanced membership. They do this at a rate $.5 \alpha x$. Find an expression for how y , the number of people with enhanced membership, varies with time. y is initially zero and the numbers of people x and y are large enough to be considered as continuous variables.

After a time T , enhanced membership loses some of its attraction and members start to leave enhanced membership at a rate $.25 \alpha y$. Find an updated expression for how y varies with time.

During the second subject interview (usually conducted with Dr Dean), you will be asked to talk for five minutes about:

- i) what attracts you to Engineering
- ii) any contact you have had with it to date. (This might include a description of some work experience, perhaps a University taster course, or some reading you have done.)
- iii) some topic that you came across in this contact that you can analyse using your Maths and Physics. **In preparation for this please prepare three PowerPoint (or equivalent) slides and bring printed versions of these along to the interview.** Unfortunately, there will not be time to set up a computer to display these. In this interview you will also be asked to attempt an unseen problem.

Those candidates interviewed via Skype should email their solutions to Mr Cei Whitehouse at c.whitehouse@joh.cam.ac.uk at least 24 hours in advance of their interview.

Candidates are advised, for obvious reasons, not to discuss their solutions or the contents of their interviews with anyone likely to come in contact with other candidates.