Cambridge University, Engineering Department

Preparing and taking exams: Exam skills and Well-being

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CUED

Introduction

- We will go through some ***facts*** about CUED exams and assessment: when, what, where, who, how…
- We will talk about ***strategy*** for revision and during the exams.
- We will also talk about ***support*** available to you in what tends to be a stressful time.

Everyone has their own ways of revising: use the bits of this which work for you.

And remember: you wouldn't be here if you couldn't do exams, so don't despair!

Why do we examine students?

To make sure that students have grasped the relevant material to progress to the next year.

Preparing for exams contributes to your learning.

Taking the exams is not the aim of the course, but it motivates and is a checkpoint to make sure you are prepared for the following year.

Summative and formative assessments

Exams are called ***summative assessments***. They provide a picture of how well you have mastered certain aspects of the course at a given time.

Exams do not really help you find out how well you understand the material; you have many other opportunities for this; ***supervisions, lab feedback, DoS meetings, January progress test (IA), etc.***

This is called ***formative assessment***. It does not necessarily carry marks, but is crucial to your learning and development. Make the most of these moments.

How to find out and who to ask?

Exams, coursework, rules, guidance:

- On CUED Undergraduate Teaching website
- Read your emails!
- Ask DoS

And for questions such as

‘Is this bit examinable?’

‘Am I doing enough work/how am I progressing?’

→ discuss with supervisor or DoS

How to find out and who to ask?

There's loads of administrative information on the web!
http://teaching.eng.cam.ac.uk

	Key information	Useful links
	Engineering Course overview Registration & start of year information Part IA Guide	Lent term key dates SSJC Newcomers Guide
	Part IA syllabuses and on-line resources IA Examples paper repository Lab and coursework handouts	Timetables Part IA lab groups Rearranging coursework & allowances
	Practical information about Part I exams Part IA Examination guidelines Part IA past tripos papers & cribs	Exam skills session
	Preparation for IB	Industrial experience Research Opportunities, Awards and Scholarships

http://teaching.eng.cam.ac.uk/past-papers/part-ia

Logistics

Lectures finish Wednesday 25th May – exams two weeks later

The current timetable, *that may be subject to slight change* is

Wednesday 8th June: Mechanical Engineering
Thursday 9th June: Structures and Materials
Monday 13th June: Electrical and Information Engineering
Tuesday 14th June: Mathematical Methods

Each exam will have 10 minutes reading time
Each exam will last for 3 hours

Calculators and Databooks

Make sure you have an authorised calculator

And can use it! If you're not already doing so, use it for everything from now on

Data Books will be available for all exams

Lots of useful stuff! Look through them, so you know what is there (and what *isn't* there)

Exam structure Part 1A

3 hour papers

No choice of questions

200 marks per paper

So aim to cover about 1 mark per minute

Exam structure

Paper 4

MATHEMATICAL METHODS

*Answer **all** questions.*

*The **approximate** number of marks allocated to each part of a question is indicated in the right margin.*

Answers to questions in each section should be tied together and handed in separately.

There are no attachments.

STATIONERY
Single-sided script paper

SPECIAL REQUIREMENTS
Engineering Data Book
CUED approved calculated allowed

IA Question structure: Short questions

10 marks

May be a series of linked steps

Statement of principle, derivation of equation

Straightforward application

3 (**short**)

(a) Find the distance from the point P = (l,m,n) to the plane whose equation is given by

$$Ax + By + Cz = D \qquad [5]$$

(b) What is the distance from $(2, -1, 3)$ to the plane $2x - 2y - z = 9$? [5]

NB. Since 2018/19 for IA Paper 4 short questions are multiple choice

IA Question structure: long questions

7 (**long**)
A function f is given by

$$f(t) = \begin{cases} 0 & -\pi \le t \le -\frac{\pi}{2} \\ \cos t & -\frac{\pi}{2} \le t \le \frac{\pi}{2} \\ 0 & \frac{\pi}{2} \le t \le \pi \end{cases}$$

and is periodic with period 2π.

(a) Using one of the series in the Maths Databook, find the corresponding Fourier Series for $f(t)$. [4]

(b) Derive using integration the coefficient of $\cos 6t$, and show that the answer you derive agrees with that found when answering part (a) [10]

(c) Explain:
(i) why there are no sine terms in the Fourier Series for $f(t)$; [3]

(ii) what properties of the function $f(t)$ determine the rate at which the Fourier Series converges. [6]

(d) By considering $g(t) = f(t) - \frac{1}{2}\cos t$, or otherwise, explain carefully why the Fourier Series for $f(t)$ is missing the frequencies that it is. [7]

30 marks

Statement of principle, derivation of equation

Straightforward application

And: Probe some aspects in more depth

Exam technique:

Reading time

10 mins reading time

You are **not** allowed to write anything

Stay calm and look through the whole paper

→ ***Decide which order to attempt questions***

Start with your strongest topics

You can do the questions in any order: don't necessarily start at the beginning of the paper

Exam technique:

Managing your time

Try to attempt all the questions

Exams are ‘against the clock’: you have to work fast

Most people run out of time.

Time management is important

- The first few marks on any question are the easiest.
- It’s really hard to get 100%.

So: keep an *eye on the clock*, make a *note* of when you should be starting the next question and *obey your own notes*!

Exam technique:

Getting marks

Most marks are for *method*, *understanding* and *insight* rather than just getting the right answer

This is not the case however for multiple choice questions

Explain what you're doing

If you get stuck/run out of time: explain what you're *trying* to do

Hand in *everything*, even crossed-out answers that you think may be wrong

(In future years where there is choice: if you attempt more questions than required, hand them all in. They will be marked and the best marks are used where a candidate answers too many questions)

Exam technique:

Getting marks

Answer the question

Examiners can **only** give marks for answers to the exact questions set.

- Don’t just do a brain dump of things which might be relevant: link them to the question on the paper
- Don’t answer the question you wish the examiner had set
- Don’t answer the question the examiner set last year which looks vaguely similar

Exam technique:

Keeping the examiner happy!

- Write **legibly**
- Lay your answer out **clearly**, highlight answers
- New question, new sheet of paper
- Whenever possible, provide **diagrams** (big enough to read) and **equations**
- Use **bullets** rather than lots of text
- If you have remaining time: **take time at the end of the exam** to check your script.

Revision strategy: Why

To complete the learning process!

Revisions help you consolidate a number of engineering skills you will need in later years.

Try not to have a short-sighted view of exams. Focus on developing a deep understanding of the course content, and test this understanding through practice.

Learning how to do 20 years of past exams without properly understanding the content won't help you much in part II and later in your life.

Guidance here is general – find your own optimum way of working

Revision strategy: When

Part IA: Next term, you have 4 weeks of labs/lectures.
Exams start less than 2 weeks after that.

You need to start preparation for exams well in advance

Make lists early on (now!) of what you need to cover

Timetable: when do you plan to do it? Do some early in the vacation; don't plan to work all the time, but take some proper holiday.

Learning is cumulative: revisit topics at regular, frequent time intervals

Learning is not linear: Many threshold concepts in Engineering

Revision strategy: How

All revision must be 'active' – don't just read notes

- Make brief 'revision notes' from lecture material

- Test your understanding by revisiting examples paper questions and Tripos questions

- Do Tripos questions from past papers:
  - Revise a topic
  - See how far you can get without looking at notes
  - If you get stuck, look at notes
  - Only look at the crib when you can't do more

- Then attempt questions against the clock, without notes

Revision strategy: How

Work with each other?

- Formulating a proper question about something you do not understand is often what's needed to unlock the problem.

- Explaining concepts and methods to someone else helps reinforcing your own understanding.

- If you can't explain it simply, you don't really understand it!

Revision strategy: Routines

Look after yourself physically: eat, drink, exercise and sleep

Aim for steady work rate

Strict division: Work time; relaxation time

Don’t give up social/sporting/other activities, but don’t over-do them

When?

NOT late at night and sleeping in. You’ll need to be alert for 9am exams

Where?

‘Go out to work’ e.g. library, so you can ‘switch off’ when you’re in your room

Things going pear-shaped?

Stress levels can get high; students wind each other up…

It's not just you!

Don't struggle in silence and alone. Talk to:

Tutor (or College nurse, chaplain, JCR welfare officer, etc)

DoS, Supervisor

Friends and family

If you become ill, see your doctor immediately

Lots of great advice at:

What to do if things go wrong: teaching.eng.cam.ac.uk/node/4439

UCS: http://www.counselling.cam.ac.uk/selfhelp/leaflets

Checklist

- ✓Data books are your friends: get to know them
- ✓Draw up a revision timetable
- ✓Active revision
- ✓Work steadily and sensibly, look after yourself
- ✓Put time aside for relaxation
- ✓Do Tripos questions against the clock next term
- ✓Check you've had a go at scanning and uploading a script before hand
- ✓Read the paper and answer the exact questions set
- ✓Don't panic

Questions?