

Cambridge University  
Engineering Department  
Tripos Exam Skills

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# 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.

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,

To place candidates in the correct *order of merit*, based on an equitable procedure that gives the best information about relative abilities,

This is not a way to get detailed feedback on how well you understand certain topics.

# *Approximate* class boundaries and proportions in each class

Class	% on exams*	% of cohort
1 <sup>st</sup>	>70%	30%
II.1	60-70%	50%
II.2	50-60%	(10-15%)
III	40-50%	(5-10%)
Fail	<40%	(<2%)

(approximate percentages for distribution between classes for II.2 and below)

\* i.e. not including coursework marks

# 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/am I in danger of failing?’

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

# Logistics

Timetables are on-line

Your candidate number is sent to you at College: make sure you know it.

**Part I:** A few days before the exams, check the Baker Building noticeboards for locations of exams (should be on website too). Check in advance that you know where to go!

**Part II:** Room allocation online. Some split rooms – check on door.

Candidates will be admitted to the exam room 15 minutes before the scheduled start time and be given 10 mins reading time

# 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

**You get all Data Books in all exams**

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

**Take with you**

Student id, pens, rulers etc



# 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

# 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

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

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

# Question structure: long questions

7 (long)

A function  $f$  is given by

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

30 marks

Statement of principle, derivation of equation  
Straightforward application

**And:** Probe some aspects in more depth

and is periodic with period  $2\pi$ .

(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]

# Exam technique:

## *Reading time*

### 10 mins reading time

You aren't allowed to write anything

Look through the whole paper

Don't panic!

Decide which order to attempt questions

Choose which questions to tackle first: 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*

### **Attempt all the questions**

Exams are 'against the clock': you have to work fast

Most people run out of time

***Time management is vital***

Remember: a bit less than than 1 minute per mark

The first few marks on any question are the easiest

It's really hard to get 100%

If you don't attempt a question you can't get any marks for it

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

You're usually not penalised badly for calculator errors

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 should be marked and the best marks used)

# Exam technique:

## *Getting marks*

The most important thing of all:

***Answer the question***

**Examiners can only give marks for answers to the exact questions set.** Read the question carefully and do all parts of it

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
- **Take time after the end of the exam** to check your script:  
tie your answers together *in correct numerical order*  
Fill in cover sheets correctly  
Check none of your answers are mixed with the spare paper

# 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

# 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're really tried and can't do more
- Then attempt questions against the clock, without notes

# 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; It's not just you!

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

Tutor (or another College contact, e.g. nurse, welfare officer)

DoS, Supervisor

Friends and family

If you become ill, see your doctor immediately

Lots of great advice at:

<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
- ✓ Make sure you know where your exams are
- ✓ Arrive **at least** 15mins before the start of the exam
- ✓ Read the paper and answer the exact questions set
- ✓ Don't panic

Questions?