What is Computer Science at University Level?
The department past and present
The aims of our course
The course ("Tripos") structure
The first year options
Employment prospects
The CS application process
Interviews and tests
Where to get more info
What is CS?

Combines Elements of...

- Natural Science
- Engineering
- Technology
- Maths
- Electronics
- Psychology
- Natural Language
- Philosophy

Teaches...

- Critical thinking
- Rigorous problem analysis
- Efficiency
- Solution Evaluation
- Programming skills
- Logic and proof
Why Study it Here?

All the usual Cambridge advantages apply: the College structure, the supervision system, the learning environment, the smart peers.

But Computer Science here is particularly special: there is a rich history both in the technology *and* the teaching of the subject.
80 Years Ago...

We started as a part of the Mathematics Department in 1937. Back then we were the Mathematical Laboratory because the term "computer science" hadn't been invented.

The world's first usable computer (EDSAC) was built here.
First Job Queue too..!
An (Abridged) Timeline

- 1930: We are founded (1937)
- 1964: School of Computing at Manchester (1964)
- 1975: EECS at MIT (1975)
Department Highlights


First CS Dept

First stored-program Computer (EDSAC)

First CS Qualification (Diploma)

EDSAC2

Full CS Degree

Xen spinout

Raspberry Pi

Unikernels

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The Lab Today

www.cl.cam.ac.uk/admissions
Not forgetting...
Our Undergraduate Degree
(the “Computer Science Tripos”)

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Our Aims

To give an understanding of fundamental **principles** that will outlast today's **technology**

To produce graduates who **create** the future not just cope with it
### The Course

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part IA</td>
<td>Part IB</td>
<td>Part II</td>
</tr>
<tr>
<td>Fundamentals Programming Electronics Maths [+Option]</td>
<td>Theory Systems Hardware Programming Group Project</td>
<td>Free choice of advanced topics Personal project</td>
</tr>
</tbody>
</table>

B.A.
The Course

Year 1
- Part IA
  - Fundamentals
  - Programming
  - Electronics
  - Maths
  [+Option]

Year 2
- Part IB
  - Theory
  - Systems
  - Hardware
  - Programming
  - Group Project

Year 3
- Part II
  - Free choice of advanced topics
  - Personal project

Year 4
(Optional)
- Part III
  - Free choice of research topics
  - Research project

B.A.

M.Eng.
The Course

Year 1
- Part IA
  - Fundamentals
  - Programming
  - Electronics
  - Maths
  [+Option]

Year 2
- Part IB
  - Theory
  - Systems
  - Hardware
  - Programming
  - Group Project

Year 3
- Part II
  - Free choice of advanced topics
  - Personal project

Year 4 (Optional)
- Part III
  - The choice of research topics
  - Research project

B.A.

M.Eng.

Needs a First

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Our First Year Options

There are always four exam papers to sit

You spend a quarter of your first year studying material for each paper
Our First Year Options

- CST 75%
  - CST 1
  - NST Maths
  - CST 2
  - CST 3

- CST 50% NST/PSY
  - CST 1
  - NST Maths
  - CST 2
  - NST Option

- CST 50% Maths
  - CST 1
  - MST 1
  - CST 2
  - MST 2

> Ran for first time in last year
> Three CS papers coupled to one maths
> The material covers graphics, databases and machine learning
> Intended for those with prior experience
Our First Year Options

- CST 75%
  - CST 1
  - CST 2
  - NST Maths
  - CST 3

- CST 50% NST/PSY
  - CST 1
  - CST 2
  - NST Maths
  - NST Option

- CST 50% Maths
  - CST 1
  - CST 2
  - MST 1
  - MST 2

> Lets you study two CS papers, one maths and a Natural Sciences subject of your choice

> Physics, Chemistry, Evolution & Behaviour, Geology, Physiology of Organisms, Social Psychology

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Our First Year Options

- Lets you study two CS papers, one maths and a Natural Sciences subject of your choice
- Physics, Chemistry, Evolution & Behaviour, Geology, Physiology of Organisms, Social Psychology
- You can switch into the NST subject in the second year without any penalty (nice option, rarely used)
Our First Year Options

> Lets you study two CS papers and two Maths papers from the Mathematical Sciences Tripos

> Good way to do more maths in IA if you are more theory-oriented. But it's not an easy option.

> You cannot switch to mathematics in the second year
Our First Year Options

> Lets you study two CS papers and two Maths papers from the Mathematical Sciences Tripos
> Good way to do more maths in IA if you are more theory-oriented. But it's not an easy option.

> You cannot switch to mathematics in the second year

Adds STEP Maths Requirement
2016 Intake Choices

Total 100 CST Students (and 63 NSTs)
Implications for Future Years

75% CST exam papers

Year 1 | Year 2 | Year 3

50% Year 1 | Year 2 | Year 3

CST exam papers
Implications for Future Years

Everyone is assessed on 11 exam papers across the three year B.A.

CST exam papers

50%

75%

Year 1

Year 2

Year 3

P1
P2
P3
P4
P5
P6
P7
P8
P9
P10

Plus the maths paper

Plus two more papers:
Maths, NST
Maths, Psy
Maths, Maths

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You can select CST Paper 1 as an option within Natural Sciences.

It is possible to catch up CS Paper 2 in your summer vacation and switch to Computer Science in your second year (and some do).
Practical skills

**Year 1**
Weekly practicals to consolidate lecture material

**Year 2**
Weekly practicals to consolidate lecture material
**Group Project** (team work)

**Year 3**
**Personal project**

**Year 4**
**Research project**
Some modules associated with additional practicals
Languages aren't important.

**Principles** are.

**As of today:**
Java, C/C++ for imperative programming
ML for functional programming
Prolog for logic programming
Verilog for hardware programming
Python for data science
Programming Experience

You DON'T need programming experience

We teach from the ground up.
However, if you've never programmed before, how do you know you'll enjoy a degree that uses it?

A survey of our first years...

- No experience (39%)
- Not much experience (24%)
- Some experience (18%)
- Quite a lot of experience (14%)
- Programming expert (2%)
Employment Prospects
Cambridge graduates 'the most employable in the world'

The Global Employability University Ranking, published by the International New York Times, names Cambridge as the world's top institution for graduate employment.
The course gives vital skills for every sector. Good computer scientists go on to a multitude of careers: IT, business, politics, finance, science, engineering, education, arts.
Very sought-after graduates

Jobs galore!

Our annual recruitment fair attracts 50+ companies, each looking to recruit 3 or 4 graduates on average.

We only produce ~100 graduates in total!

Some of the 2016 Companies

Google, ARM, Amazon, Disney, Barclays, Cisco, BT, Mozilla, MathWorks, Citrix, Frontier, Red Gate, Red Gate, Morgan Stanley
Applications Process
The Process

- Apply via UCAS: October
- Supplementary Questionnaire: November/December
- Written Test (CSAT):
- Two Technical Interviews: Interview Day (Early December)
- Admissions Pool: Early January

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Admissions is Done by the Colleges

The University is a combination of:

**Colleges** – these admit and look after students both in terms of welfare and academics. They arrange the supervisions we are famous for

**Departments** – these set syllabuses, provide lectures and handle exams. They also perform research (their 'day job')

**Administration** – there is a large number of admin-related entities: everything from finance to entrepreneurship to IT to dental services
**DoS** – Director of Studies. At least one per subject per College. In charge of the academic progress of the students in their subject. Key for the admissions process.

**Admissions Tutor** – One per College. Makes the final decision on who gets in or pooled based on the recommendations of the DoSes.
Choosing a College for CS

Colleges are responsible for academic guidance, supervisions and pastoral care
They provide diverse communities where you build life-long friends and associations

The best College for you is an individual choice

Modern or classical buildings?  
Centre or out of town?  
Large or small CS cohort?  
More formal or more relaxed feel?  
How active is the DoS in teaching?  
What do past and present students say?  
etc...

We can't tell you which College is right for you (sorry!). Visit them and talk to the Fellows, staff and students there.
Every application is individual but usually all of these factors contribute to our decisions:

- Exam predictions and results
- Interviews
- Personal statement
- School references
- Special circumstances (if any)
- CSAT performance
Selection Factors

Every application is individual but usually all of these factors contribute to our decisions:

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- Special circumstances (if any)
- CSAT performance
Prerequisites

**A*A*A at A-Level**

**A-Level Maths**

is absolutely essential

**Further Maths**

AS is essential (if your school offers it)
A2 is desirable
AEA/STEP is useful

Not doing Further? We recommend doing at least AS Further in your A2 year
Other A-Levels

Physical sciences

Very useful and desirable at admissions
Prerequisites for some first year options

Electronics

Relevant and useful

But not as desirable as maths and physical sciences so please don't drop these in favour of electronics
Other A-Levels

Computing/Computer Science

NOT a prerequisite

Good way to show interest in the subject and to “try before you buy”

However, the syllabuses overlap with our first year

**We don't recommend dropping maths (or even a physical science) in favour of Computing in the A2 year:** often better to drop Computing in A2
Every application is individual but usually all of these factors contribute to our decisions:

- Exam predictions and results
- Interviews
- Personal statement
- School references
- Special circumstances (if any)
- CSAT performance
~25 minutes each

Questions related to CS but will not assume actual CS knowledge (unless we know you have it)

Questions start simple and ratchet up in difficulty. Our interest is in when you leave your comfort zone

Correct answers (and there may be multiple) aren't as important as you might think

We are assessing your logical thinking and problem solving abilities and your motivation to study CS
Selection Factors

Every application is individual but usually all of these factors contribute to our decisions:

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- Special circumstances (if any)
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The CSAT

Computer Science Admissions Test

It's there to help you!
Another opportunity to shine, besides the interview.
Another opportunity to shine, besides the interview.

Our interest: what you can do (not what you can’t). We want you to do well (it’s not there to catch you out).
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Your choice of questions! Like pure maths more than algorithmic problems? No problem. Show us what you enjoy!
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No pass mark. We consider the positive aspects.
What Now?

**Upstairs** you will find:

- DoSes to answer those burning questions
- Past students to get the real story from
- The CSAT stand
- Overviews of the syllabus
- Examples of student projects
More info...

University

Prospectus
Website (www.cam.ac.uk)

Colleges

Websites
DoSes, Admissions Tutors
Open days

Department

Ask us upstairs today!
undergraduate.admissions@cl.cam.ac.uk
Website

www.cl.cam.ac.uk/admissions