Studying Computer Science at Oxford

Computer science is about understanding computer systems and networks at a deep level.

Computers and the programs they run are among the most complex products ever created; designing and using them effectively presents immense challenges. Facing these challenges is the aim of computer science as a practical discipline, and this leads to some fundamental questions:

- How can we capture in a precise way what we want a computer system to do?
- Can we mathematically prove that a computer system does what we want it to?
- How can computers help us to model and investigate complex systems like the Earth's climate, financial systems or our own bodies?
- What are the limits to computing? Will quantum computers extend those limits?

The theories that are now emerging to answer these kinds of questions can be immediately applied to design new computers, programs, networks and systems that are transforming science, business, culture and all other aspects of life.

Computer Science at Oxford concentrates on bridging theory and practice, including a wide variety of hardware and software technologies and their applications.

Studying Computer Science at St Anne's

St Anne's is one of few colleges in Oxford that has a large cohort of dedicated Computer Science Fellows. Between them they research a variety of fields and can offer a very wide range of tutorial teaching in both theoretical and practical areas of computing.

As a Visiting Student at St Anne's you can choose a selection of courses from different years of the undergraduate course that fit your experience and interests. Popular choices have included: Functional Programming, Design and Analysis of Algorithms, Intelligent Systems, and Computer Graphics.

The Computer Science Department has advanced research groups in Machine Learning, Verification of Systems, Computational Biology, Quantum Computing and other specialist areas, and specialist courses in these areas may be available for Visiting Students with the right background.

Study durations

You can apply to study Computer Science as a single or joint subject. College has a preference for applicants applying for the Extended academic year or academic year.

	Ext AY	AY	Fall Term	Hilary and Trinity terms	Studied with other subjects
Computer Science	☑	☑	☑	☑ Only possible with another subject, such as maths or philosophy.	☑ Preference to study with a subject taught jointly with computer science, such as maths or philosophy. Please enquire about studying computer science with other subjects from humanities or social sciences. It is not possible to study computer science with another science subject.

Courses

Oxford undergraduates studying computer science would generally study 3-4 course per term and as a visiting student at St Anne's you would be expected to do the same.

Visiting Students will need to attend the lectures and practical sessions for the courses in the CS Department, and depending on the course level these may be supplemented with tutorials (1-3 students) and/or small group classes (up to 10 students) or some combination of these.

You can read [descriptions of all computer science courses on the department website](). Please note these are updated in week 0 of the academic year, so the 2024-25 courses are also the most up to date courses for visiting students applying for the 2025-26 academic year. There are not usually significant changes from one year to the next. Note that not all courses listed on the website are available to visiting students.

Recommended courses

The following courses are recommended for Visiting Students wishing to study computer science.

The following is a list of courses that should be **accessible to students with little formal educational background in CS**. It should be noted, however, that all courses require a strong mathematics background.

- Continuous mathematics
- Design and Analysis of Algorithms
- Digital Systems
- Discrete Mathematics
- Functional Programming
- Imperative Programming
- Linear Algebra
- Introduction to Proof Systems

The following courses are **more advanced** and require some formal education in CS as well as **very strong mathematical ability**:

- Models of Computation
- Concurrent Programming
- Logic and Proof

Most of the **following courses are usually taught through classes in the CS Department** and all rely on some other elements of the core course, so enrolment in these options would be dependent on **demonstrating the correct level of previous experience in supporting areas of Computer Science**.

Courses available to visiting students 2024-25 academic year

| Course | Term | Faculty | | College | Practicals | Offered to |
		Lectures	Classes	Tutorials		
Michaelmas Term						
Discrete Mathematics (CS3)	MT	16		5		Prelims
Functional Programming (CS1)	MT	16		6	Y	Prelims
Linear Algebra (CS4)	MT	20		5		Prelims
Models of Computation	MT	16		5		Part A Core

Course	Term	Lectures	Classes	Practicals	Y	Part
Compilers	MT	16		4	Y	Part A Core
Artificial Intelligence	MT	16	4		Y	Part A & B
Computer Aided-Formal Verification	MT	16	4			Part A & B
Computer Graphics	MT	16	4		Y	Part A & B
Computer Security	MT	16	4			Part A & B
Concurrency	MT	16	4		Y	Part A & B
Data Visualisation	MT	16	4			Part A & B
Geometric Modelling	MT	16	4		Y	Part A & B
Logic and Proof	MT	16	4			Part A & B
Machine Learning	MT	20	4		Y	Part A & B
Scientific Computing	MT	16	4			Part A & B
Combinatorial Optimisation	MT	20	6			Part B & C
Bayesian Statistical Probabilistic Programming	MT	20				Part C
Computational Biology	MT	20	4			Part C
Computational Game Theory	MT	20	4			Part C
Hilary Term						
Continuous Mathematics (CS3)	HT	16		4		Prelims
Design & Analysis of Algorithms (CS1)	HT	16		4	Y	Prelims
Digital Systems (CS4)	HT	16		4	Y	Prelims
Imperative Programming (CS2)	HT	20		6	Y	Prelims
Algorithms and Data Structures	HT	16		6		Part A Core
Concurrent Programming	HT	16		4	Y	Part A Core
Computational Complexity	HT	16	6			Part A & B
Computer Architecture	HT	16	4		Y	Part A & B
Computer Networks	HT	16	4		Y	Part A & B
Databases	HT	16	4		Y	Part A & B

Lambda Calculus and Types	HT	16	4			Part A & B
Physics Informed Neural Networks	HT	16	4			Part A & B
Principles of Programming Languages	HT	16	4		Y	Part A & B
Quantum Information	HT	16	4			Part A & B
Requirements	HT	16	4			Part A & B
Advanced Security	HT	22	4		Y	Part C
Automata, Logic and Games	HT	24				Part C
Categories, Proofs and Processes	HT	20				Part C
Computational Medicine	HT	20	4			Part C
Computer Vision	HT	20			Y	Part C
Foundations of Self-Programming Agents	HT	20	6			Part C
Geometric Deep Learning	HT	20			Y	Part C
Knowledge Representation & Reasoning	HT	22	4			Part C
Uncertainty in Deep Learning	HT	20			Y	Part C
Trinity Term						
Digital Systems (CS4)	TT	8		2	Y	Prelims
Introduction to Proof Systems (CS2)	TT	12		3		Prelims

Notes:

- Prelims courses are offered to first year Oxford students. These courses usually include College tutorials and if you wish to undertake tutorial teaching in computer science you will need to include some of these courses in your course preferences.
- Part A core courses are offered to second year Oxford students.
  Part A and B courses are offered to second and third year Oxford students.
- Part C courses are offered to fourth year and MSc students – these are generally not suitable for visiting students unless you have deep expertise in computer science and maths already.

Visiting students who intend to take a course with practicals, which we would recommend you do, must attend the induction arranged by the Department of Computer Science.

Trinity term teaching in computer science is limited and many visiting students will either study another subject during Trinity (if they applied and were offered a place for another subject) or undertake a supervised project or independent study in computer science.

Pre-requisites

You will need to already be studying computer science, and have declared or be intending to declare a major/concentration in computer science at your home institution. You will need to have a strong maths background and have taken university level maths, in addition to computer science courses.

Additional information

Department of Computer Science https://www.cs.ox.ac.uk/