

Studying Computer Science at St Anne's College

Computer Science at Oxford concentrates on bridging theory and practice, including a wide variety of hardware and software technologies and their applications. It is possible to take some of these courses as a Visiting Student. Visiting Students will need to attend the lectures and practical sessions for the courses in the CS Department, and these will be supplemented with tutorials (1-3 students) and/or small group classes (up to 10 students) or some combination of these.

Tutorials and classes:

Generally first year Oxford students undertake computer science teaching in tutorials in College and if you wish to experience tutorial teaching in computer science you should select some first year, or prelim courses.

In tutorials you will discuss ideas in depth with an experienced computer scientist, usually with just one or two other students. You will be expected to spend a considerable amount of time developing your own understanding of the topics covered in lectures, answering questions designed to check your understanding, and preparing for tutorials, practical sessions and small classes.

Most visiting students choose courses from the second year of the Oxford degree programme, or sometimes the third year with an appropriate background. These courses are generally taught by the computer science department and include small group classes, labs/practicals and sometimes other academic activities.

Background knowledge:

Some courses will be accessible to students with less formal educational background in computer science, whereas others require prior formal educational experience. *It should be noted that all CS courses at Oxford require a very high level of mathematical ability as a prerequisite*. Some previous experience with programming is also helpful. It is possible to combine CS courses with those in other subjects available to Visiting Students, so long as appropriate ability in those other subject areas are demonstrated as part of the application.

Study duration:

To take the best advantage of computer science teaching at Oxford it is recommended that you study for the full academic year, as there is greater course selection when including study during Michaelmas term. We have a strong preference for extended academic year and academic year study in computer science.

You are also welcome to apply to study for Fall term (September + Michaelmas term) or Hilary and Trinity term. However depending on your background in computer science you may need to combine your study with another subject, for example philosophy or maths, to ensure a full course load.

Courseload:

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.

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 •
- **Functional Programming**
- Design and Analysis of Algorithms
- Digital Systems
 Discrete Mathematics
- Linear Algebra
- Imperative Programming I,II,III
- Introduction to Formal Proof

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

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.

You can read descriptions of all courses on the Computer Science Department website.

Available Courses for Visiting Students

Paper	Term	Faculty		College	Practicals	Offered to		
		Lectures	Classes	Tutorials				
Michaelmas Term								
Discrete Mathematics (CS3)	MT	16		4		Prelims		
Functional Programming (CS1)	MT	16		4	Y	Prelims		
Linear Algebra (CS4)	MT	20		4		Prelims		
Models of Computation	MT	16		4		Part A Core		
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 Security	MT	16	4		Part A & B
Geometric Modelling	MT	16	4	Y	Part A & B
Machine Learning	MT	20	4	Y	Part A & B
Principles of Programming Languages	MT	16	4	Y	Part A & B
Requirements	MT	16	4		Part A & B
Combinatorial Optimisation	MT	20	6		Part B
Computational Biology	MT	20	4		Part C
Computational Game Theory	MT	20	4		Part C
Computational Learning Theory	MT	24	4		Part C
Concurrent Algorithms and Data Structures	MT	20	4	Y	Part C
Distributed Processes, Types and Programming	MT	20		Y	Part C

Graph Representation Learning	MT	18			Y	Part C			
Probabilistic Model Checking	MT	20	4		Y	Part C			
Probability and Computing	MT	20	4			Part C			
Quantum Processes and Computation	MT	24	4			Part C			
Hilary Term									
Continuous Mathematics (CS3)	HT	16		4		Prelims			
Design & Analysis of Algorithms (CS1)	ΗT	16		4	Y	Prelims			
Digital Systems (CS4)	HT	16		4	Y	Prelims			
Imperative Programming (CS2)	HT	20		4	Y	Prelims			
Algorithms and Data Structures	HT	16		4		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 Graphics	HT	16	4		Y	Part A & B			
Data Visualisation	HT	16	6			Part A & B			
Databases	HT	16	4		Y	Part A & B			
Deep Learning in Healthcare	HT	16			Y	Part A & B			
Lambda Calculus and Types	HT	16	4			Part A & B			
Logic and Proof	HT	16	4			Part A & B			
Quantum Information	HT	16	4			Part A & B			
Advanced Security	HT	22	4		Y	Part C			
Algorithmic Foundations of Collective Decision Making	HT	20	4			Part C			
Categories, Proofs and Processes	HT	20				Part C			
Computational Medicine	HT	20	4			Part C			

Computer Vision	ΗT	20			Y	Part C	
Database Systems Implementation	ΗT	24	4		Y	Part C	
Foundations of Self- Programming Agents	ΗT	20	6			Part C	
Geometric Deep Learning	ΗT	18			Y	Part C	
Knowledge Representation & Reasoning	ΗT	22	4			Part C	
Quantum Software	HT	24	5			Part C	
Uncertainty in Deep Learning	HT	20			Y	Part C	
Trinity Term							
Digital Systems (CS4)	TT	8		4	Y	Prelims	
Introduction to Proof Systems (CS2)	TT	12				Prelims	

Notes on Oxford terminology:

The Prelims courses are offered to first year Oxford students.

The Part A Core courses are offered to second year students only.

The Part A and B courses are offered to second and third year students.

The Part B courses are offered to third year students.

The Part C courses are offered to fourth year and MSc students and are generally not suitable for visiting students without deep background knowledge in CS and maths.

If you have additional questions please email visiting.students@st-annes.ox.ac.uk