Academic INSIGHTS

immerse EDUCATION

Computer Science



AGES AND LOCATIONS

Ages 13-15: Cambridge, Oxford
Ages 16-18: Cambridge

Students are taught in separate age groups, with content and pace tailored to each.
Small classes, averaging 7 students.

COURSE INTRODUCTION

The foundations of computer science, covering Python programming, algorithms, game theory, and machine learning.

You'll learn to write Python programs, compare algorithms by complexity, and train and evaluate a simple model.

You'll leave with a completed personal project and a personalised tutor evaluation to draw on in university applications.



EXAMPLE TUTOR

Stefano F

PhD candidate in Mathematics, Mathematical Institute, University of Oxford

Stefano is a lecturer at Jesus College, Oxford, whose doctoral work designs efficient algorithms for solving equations with applications in physics and the natural sciences. He has tutored for the Mathematical Institute and Exeter College and worked in industry on applications of mathematics and AI.

Computer Science sample syllabus

Academic INSIGHTS

WEEK ONE

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
AM	**What is computer science?** Survey the field from algorithms and data through to networks, security, and AI.	**Python basics** Learn variables, data types, and conditional statements as your first programming tools.	**Functions and data** Define reusable functions and manage different types of data.	**Introduction to algorithms** Meet the common building blocks that combine to solve more complex problems.	**Searching and sorting** Work through the classic algorithms for finding and ordering data, and code them in Python.
PM	**Computing and society** Consider data privacy, online safety, automation, and the responsible use of technology.	**Loops and control flow** Write programs that repeat, branch, and respond to input.	**Writing readable, reusable code** Structure programs so they can be understood, tested, and extended, building a small interactive tool.	**1:1 tutorial** Talk to your tutor about the areas of computer science that interest you most, and get suggestions for reading and resources to take them further.	**Algorithmic complexity** Compare algorithms by runtime and space usage as the input size grows.
		Creativity masterclass Explore divergent, convergent, and lateral thinking, then use SCAMPER to generate and pitch original ideas.		**Personal project supervision** Choose a topic for your personal project, plan your research, and start shaping your presentation.	

WEEK TWO

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
AM	**Recursion and divide-and-conquer** Solve problems by breaking them into smaller versions of themselves.	**Introduction to game theory** Study decisions where the outcome depends on what other players choose.	**Machine learning foundations** Explore data-driven learning, pattern recognition, and probabilistic reasoning.	**Training and evaluating models** Experiment with different approaches and measure whether your results improve.	**Personal project presentations** Present your computer science personal project to your tutor and peers.
PM	**Shortest path algorithms** Find optimal routes through a network and see where the technique is used.	**Strategies and optimal play** Play simple games, model real situations, and program an optimal strategy.	**Neural networks** Build and train a simple model inspired by the structure of the brain.	**1:1 tutorial** Get feedback on your progress, and talk through your academic ambitions and the university courses and careers computer science can lead to.	**Personal project presentations (continued)** Respond to questions and discuss your peers' presentations.
	Critical thinking masterclass Examine the attention economy, echo chambers, logical fallacies, and cognitive bias, then debate a live issue.	**Guest speaker evening** Learn from an inspirational speaker from fields such as broadcasting, writing, philosophy, and sport, then question and debate.	**Personal project supervision** Finalise your research and slides and rehearse your presentation ready for Friday.		**Graduation ceremony** Certificates, speeches, and celebration.

Please note: this is an example syllabus and is subject to change.
Not shown: full evening and weekend social and cultural timetable.