

Bucksmore Pre-University Preparation • *Course Description*

Key Facts

Location:

St. Hilda's College

Course fees: £3,195 per week

For ages: 15-17

Class Size: 12

Hours per week: 23 hours

Minimum Duration: 2 weeks

Start Dates: 30 June or 14 July 2026

AI & Computer Science

Subjects

AI

Computer Science

Coding

Programming

Experience Being Taught at First-Year Undergraduate Level in Oxford

The Pre-University AI & Computer Science course at Bucksmore prepares students for university-level computer science studies. Through hands-on coding challenges, robotics projects, and AI-focused workshops, students develop skills in Python programming, algorithm design, computer vision, and object-oriented programming. The course combines theoretical insights with practical applications, mirroring the expectations of computer science and engineering programmes at UK universities.

Students live on campus and take part in excursions around Oxford and top UK destinations, ensuring a well-rounded learning experience that blends academic study with real-world applications.

This course mirrors the demands of computer science courses at UK universities, ensuring students are well-prepared for further studies. Students live on campus and participate in excursions around Oxford, blending academic learning with cultural exploration and practical insights into the tech industry.

For more information on this programme, please follow this link to our dedicated course page: www.bucksmore.com/summer-courses/pre-university-summer-courses/computer-science/

Course Features

This course provides an immersive introduction to computer science and AI, balancing theory with practical experimentation. Students begin by building foundations in algorithms, programming, and robotics before progressing to advanced topics such as vision-based AI, cybersecurity, and object-oriented programming.

Collaboration, critical thinking, and problem-solving are at the heart of the programme. Students apply their learning in a final robotics challenge, demonstrating creativity, technical proficiency, and teamwork. Our course aims to explore the following:

- **Programming Foundations:** Learn Python coding fundamentals, from variables and loops to conditionals and control structures
- **Robotics & Hardware:** Explore how hardware and software interact through projects using Raspberry Pi-powered autonomous cars
- **Algorithms & Problem-Solving:** Design and implement algorithms for tasks such as obstacle avoidance and maze navigation
- **Computer Vision & AI Concepts:** Use libraries like OpenCV to develop vision-based decision-making in robotics, and compare traditional rule-based logic to machine learning
- **Object-Oriented Programming (OOP):** Transition from procedural to modular programming by designing Python classes for scalable, maintainable code
- **Cybersecurity & Networks:** Investigate defensive programming, basic cybersecurity concepts, and how systems protect against hacks