Subject

A-Level Computer Science

Syllabus

OCR (H446)

What will I learn? (Inc. skills & key topics)

This course will focus heavily on developing learners’ technical problem-solving abilities and promote ‘Computational Thinking’. The course is split into three components, with two of those being exam based covering all areas of the technical functioning of computers and advanced computer programming theory. Learners will use technology to develop their understanding of how computers are used in the modern world to provide solutions to society’s biggest problems. Theoretical components will range from Algorithm complexity analysis using Object Oriented Programming (OOP) techniques, right through to how the CPU processes binary data to execute instructions. This course will also allow learners to develop the understanding that underpins high quality computer programming through using a selection of high-level languages. Students will also be required to develop a significant piece of software to solve a self-directed problem using advanced techniques in a high level language of their choice.

What topics will we cover? How will my learning be assessed?

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| --- | --- | --- | --- |
| Unit | Topic examples | Assessed by | Worth |
| **Component 01**  Computer Systems | You will learn about how computers function and how systems are developed to provide effective solutions to the problems we face as users of technology.  You will focus your learning on; Systems Architecture; Databases; Web Technologies; Networks; Data Structures, representation, and Logic; Systems Software; and Legal, moral, ethical considerations. | External  2hr 30 min examination | 40% |
| **Component 02**  Computational thinking and problem solving | You will learn how to process information in a ‘computational’ manner and how to solve problems using software solutions. You will focus your learning on; Computational Thinking; Programming Techniques; and Algorithms | External  2hr 30 min examination | 40% |
| **Component 03**  Programming Project | You will decide on a problem you would like to solve and develop a complex software solution to this problem using a high-level language of your choice. You will need to follow the full systems development life cycle. | Internal | 20% |

How will this subject prepare you for your next steps?

This course will give you the essential skills and knowledge to move into undergraduate study in the area of computer science and covers all of the necessary underpinning concepts to prepare you for Degree level study in any related technical discipline of computing or software engineering. This course is also suitable for anyone wishing to pursue a higher level or degree apprenticeship in any technical role, such as Networking, Database Development, Web Development or Software Engineering.

Contribution to UTC/Studio Aims

A-Level Computer Science is at the core of the curriculum offer for The Studio Technical/Academic pathways, being the main vehicle for students to exercise and develop their creative problem-solving abilities in a technical discipline that will allow them to be the creators of future technology rather than merely consumers of it. Computer science is perfectly placed to develop students understanding and experience in developing innovative technologies to prepare them for a long career in technological fields. The saying goes that students are being educated for jobs that don’t yet exist, so what better way to prepare for the jobs of tomorrow than learning how to solve problems and harness the innovative technology systems that will be integral to the next generation of work.

Careers/Job ideas

* [Application analyst](https://www.prospects.ac.uk/job-profiles/application-analyst)
* [Applications developer](https://www.prospects.ac.uk/job-profiles/application-analyst)
* [Cyber security analyst](https://www.prospects.ac.uk/job-profiles/cyber-security-analyst)
* [Data analyst](https://www.prospects.ac.uk/job-profiles/data-analyst)
* [Database administrator](https://www.prospects.ac.uk/job-profiles/database-administrator)
* [Forensic computer analyst](https://www.prospects.ac.uk/job-profiles/forensic-computer-analyst)
* [Game designer](https://www.prospects.ac.uk/job-profiles/game-designer)
* [Games developer](https://www.prospects.ac.uk/job-profiles/game-developer)
* [Information systems manager](https://www.prospects.ac.uk/job-profiles/information-systems-manager)
* [IT consultant](https://www.prospects.ac.uk/job-profiles/it-consultant)
* [Software engineer](https://www.prospects.ac.uk/job-profiles/software-engineer)
* [Systems analyst](https://www.prospects.ac.uk/job-profiles/systems-analyst)
* [UX designer](https://www.prospects.ac.uk/job-profiles/ux-designer)
* [Web designer](https://www.prospects.ac.uk/job-profiles/web-designer)
* [Web developer](https://www.prospects.ac.uk/job-profiles/web-developer)
* [IT sales professional](https://www.prospects.ac.uk/job-profiles/it-sales-professional)
* [IT trainer](https://www.prospects.ac.uk/job-profiles/it-trainer)
* [Nanotechnologist](https://www.prospects.ac.uk/job-profiles/nanotechnologist)
* [Network engineer](https://www.prospects.ac.uk/job-profiles/network-engineer)
* [Supply chain manager](https://www.prospects.ac.uk/job-profiles/supply-chain-manager)
* [Telecommunications researcher](https://www.prospects.ac.uk/job-profiles/telecommunications-researcher)