Computer Science: A-Level

# Course Overview

* **Exam Board** : AQA
* **Usual Age Range** : 16-19
* **Qualification :** 1 A-Level
* **Curriculum Time** : Three 50 minute lessons per week in class plus additional work in Independent Learning Time
* **Assessment** : this curriculum is assessed via:
	+ 2 x 2 hour 30 minute exams
	+ 1 x Non Examined
* **Grading** – A\* - U
* **Full specification** - [AS and A-level Computer Science Specification Specifications for first teaching in 2015 (aqa.org.uk)](https://filestore.aqa.org.uk/resources/computing/specifications/AQA-7516-7517-SP-2015.PDF)

# Curriculum Intent

The **intent** of the Computer Science curriculum is to give UTC students an opportunity to develop their understanding of the fundamental principles and concepts of Computer Science along with practical programming skills. The intent is to ensure students have advanced theoretical and practical knowledge, understanding and skills that can be applied in any Computing setting in their future career and of particular use to students considering a career in computing.

The further intent of the Curriculum is to give students useful technical skills around advanced programming such as the ability to write an effective flow chart, produce Pseudocode, and develop an understanding for advanced programming skills such as Object Orientated Programming and Unity Development.

Students are supported and encouraged to develop their **love of reading** and literacy skills on this course, by reading related computing news and articles and by completing regular extended writing activities.

Students are encouraged to develop their **numeracy** on this course by applying the mathematical skills relevant to Computer Science: including number systems of binary and hexadecimal; binary additional as well as calculating file sizes for images and sound.

Suggested next step **destinations** after completion include degrees in Computer Science, apprenticeships and employment in the emerging digital economy.

Related **careers** include working as a software developer; network support; games developer; cyber security specialist; systems analysis. This intent of the Curriculum is to also provide a good baseline knowledge, skills and understanding for students who undertake an Apprenticeship.

# Study Tips

Students will benefit additional study of Business Fundamentals:

* Isaac Computer – [Isaac Computer Science](https://isaaccomputerscience.org/)
* Test and Track – [Test&Track (testandtrack.io)](https://www.testandtrack.io/)
* Object-oriented Programming in Python: Create Your Own Adventure Game–  [[Object-oriented Programming in Python - Online Course - FutureLearn](https://www.futurelearn.com/courses/object-oriented-principles)](file:///C%3A%5CUsers%5CKaren.Nixon%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5C2TTXEF9B%5Cshorturl.at%5CtyINY)

# Curriculum Overview

The learning in A-Level Computer Science is sequenced as follows.

*Note: the full Curriculum Plans are available on request to* *info@nefuturesutc.co.uk*

**Key Topics**

* Fundamentals of Programming
* Fundamentals of Data Structures
* Fundamentals of Algorithms
* Theory of Computation
* Fundamentals of Data Representation
* Fundamentals of Computer Systems
* Fundamentals of Computer Organisation and Architecture
* Consequences of Uses of Computing
* Fundamentals of Communication and Networking
* Fundamentals of Databases
* Big Data
* Fundamentals of Functional Programming
* Systematic Approach to Problem Solving
* Non-exam assessment – the computing practical project.

**Year 12:**

**Year 13:**