Computer Science

Examination Board: AQA

Examination Code: 7517-C

Outline of the Course	The A Level Computer Science course encourages students to develop a broad range of skills and knowledge of computational thinking as a basis for progression into further learning, and/or employment in Computer Science-related fields. The topics studied in order. <u>Component 1:</u> ○ Unit 1 – Fundamentals of Programming ○ Unit 2 – Fundamentals of Data Structures ○ Unit 3 – Systematic approach to problem solving ○ Unit 4 – Theory of Computation <u>Component 3:</u> ○ NEA: The computing practical project <u>Component 2</u> ○ Unit 5 – Fundamentals of Data Representation ○ Unit 6 – Fundamentals of Computer Systems ○ Unit 7 – Fundamentals of Computer architecture ○ Unit 8 – Consequences of Computing ○ Unit 9 – Fundamentals of Communication and Networking

What will you learn?

Students will develop a strong understanding of the principles and practices of computing, including both theoretical and practical elements.

Students will learn to write and analyse code, particularly using languages like C#, and will complete an independent project where they design and develop a fully working software solution.

Component 1 encourages students to develop:

- Structure of code, trace tables and maintainable programs
- Study recursive and defensive programming
- Implement various data structures including arrays, lists, stacks queues, trees and graphs
- Design and trace algorithms for searching sorting and traversal
- Understand the time complexity and efficiency of algorithms
- Solve problems through heuristic approach
- Understand abstraction and decomposition in problem solving.
- Apply algorithmic thinking to develop solutions.
- Recognise different problem-solving strategies.
- Understand the principles of functional programming
- Learn high order functions using the functional language Haskell
- An understanding of finite state machines and regular expressions including BNF, Turing machine and language classification

Component 2 encourages students to develop:

- An understanding of the organisation of computer systems including software, hardware, data, and communications.
- An understanding of how data can be represented through text, sound, images and numbers.
- The fundamentals of computer architecture including Von Neumann, CPU and Instruction Sets through Assembly language.
- The theoretical and practical understanding of databases include the query language SQL.
- An awareness of emerging technologies and an appreciation of their potential impact on society including ethical, legal and cultural issues.
- The fundamentals of computer networks, addressing and the internet.

Component 3 encourages students to develop:

- Experience in carrying out the project Life Cycle using an iterative approach.
- An understanding of a real-life problem
- Investigate the needs of stakeholders
- Research and consider the feasibility of a proposed solution
- Design and test a system using abstraction and decomposition

- Develop a fully working solution using algorithmic elements from component 1.
- Evaluation and carry out robust testing using user feedback

Mark Breakdown and Assessment

Unit Title	Method	Time	Weight
Component 1: Fundamentals of Programming	**On Screen Exam**	**2 hours 30 mins**	**40%**
Component 2: Fundamentals of Theoretical Concepts	**Paper Exam**	**2 hours 30 mins**	**40%**
Component 3: NEA	**Coursework**		**20%**

Paper 1 (Component 1):

- 40% of A Level
- 2 hour 30 minute on-screen examination
- Preliminary Material released on 1st September in Y13
- Short answer questions and programming tasks to complete
- Covering the following content:

  - Unit 1 – Fundamentals of Programming
  - Unit 2 – Fundamentals of Data Structures
  - Unit 3 – Systematic approach to problem solving
  - Unit 4 – Theory of Computation

Paper 2 (Component 2):

- 40% of A Level
- 2 hours 30 minutes written examination
- A series of short-answer and extended-answer questions.

  - Unit 5 – Fundamentals of Data Representation
  - Unit 6 – Fundamentals of Computer Systems
  - Unit 7 – Fundamentals of Computer architecture
  - Unit 8 – Consequences of Computing
  - Unit 9 – Fundamentals of Communication and Networking

NEA (Component 3): The computing practical project

- 20% of A Level
- Students write a report that documents a programmed solution to a real problem associated with a user whose realistic needs should be considered when specifying, designing and implementing the solution.
- Completed in lessons and students' own time
- Internally assessed and externally moderated

Website links	https://www.aqa.org.uk/subjects/computer-science/a-level/computer-science-7517/specification
Key Dates	Exam: Year 13: May/June 2026 NEA: rough submission date – 15th May 2026
Further Information	SPECIAL FEATURES OF THE COURSE • Greater opportunities for practical programming work • Wide range of programming problems analysed, studied and undertaken • Students as active investigators rather than passive learners • This course provides a good foundation for abstract thinking, general problem-solving, algorithmic and mathematical reasoning, scientific and engineering-based thinking, when investigating future challenges SUBJECTS WHICH COMPLEMENT COMPUTER SCIENCE Students may also consider taking Mathematics, Further Mathematics, or Physics alongside this qualification.
What can I do after I have completed the course?	A qualification in Computer Science offers students a first step into the varied world of Computer Science and IT, with careers including, software/app/games development, hardware engineering, telecoms, project management and systems analytics. In addition, the range of related careers is diverse, and successful students may consider career options in engineering, medicine, law, business, politics and any type of science.