

A-Level Computer Science in Year 12

Course Content

A-Level Computer Science in Year 12 will focus on the following components.

Paper 1: This paper tests a student's ability to program, as well as their theoretical knowledge of computer science from subject content 1 – 4. It is assessed on-screen.

1. Fundamentals of programming in Java
2. Fundamentals of data structures
3. Systematic approach to problem solving
4. Theory of computation

Paper 2: This paper tests a student's ability to answer questions from subject content 5 – 9. It is assessed by written paper.

5. Fundamentals of data representation
6. Fundamentals of computer systems
7. Fundamentals of computer organisation and architecture
8. Consequences of uses of computing
9. Fundamentals of communication and networking

Paper 1

Fundamentals of Programming in Java

- Data types
- Programming concepts
- Arithmetic, Relational and Boolean operations in a programming language
- Constants and variables in a programming language
- String-handling operations in a programming language
- Random number generation in a programming language
- Exception handling
- Subroutines (procedures, functions, parameter passing)
- Local and Global variables
- Procedural-oriented programming

Fundamentals of data structures

- Data structures
- Single- and multi-dimensional arrays
- Fields, records and files

Systematic approach to problem solving

- Analysis
- Design
- Implementation
- Testing
- Evaluation

Theory of computation

- Abstraction and automation
- Finite State Machines

Paper 2

Fundamentals of data representation

- Number systems
- Number bases
- Units of information
- Binary number systems
- Information coding systems
- Representing images, sound and other data
- Data compression
- Encryption

Fundamentals of computer systems

- Hardware and Software
- Classification of programming languages
- Types of program translator
- Logic gates
- Boolean algebra

Fundamentals of computer organisation and architecture

- Internal hardware components of a computer
- The stored program concept
- Structure and role of the processor and its components
- External hardware devices

Consequences of uses of computing

- Individual (moral), social (ethical), legal and cultural issues and opportunities

Fundamentals of communication and networking

- Communication methods
- Communication basics
- Network topology
- Types of networking between hosts
- Wireless networking

Year 12 Internal UCAS Exam Week

Paper 1 & 2 carry equal weighting and include:

- On-screen exam: 1 hour 45 minutes
- Written exam: 1 hour 45 minutes

Specification and Examination Board:

Computer Science: 7516/7517

Examination Board: AQA

<http://www.aqa.org.uk/subjects/ict-and-computer-science/as-and-a-level/computer-science-7516-7517>