

## Year 12 and 13 - A Level Computer Science

### Curriculum content

| Half term       | Year 12                                                                      |                                                                                                       | Year 13                                                        |                                                                                                                                                                |
|-----------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | Paper 1                                                                      | Paper 2                                                                                               | Paper 1                                                        | Paper 2                                                                                                                                                        |
| <b>Summer 2</b> |                                                                              |                                                                                                       | Data Types<br>Types of programming language<br>Boolean Algebra | Thinking Abstractly<br>Thinking Ahead<br>Thinking Procedurally<br>Thinking Logically<br>Thinking Concurrently<br>Programming Project – Project Proposal        |
| <b>Autumn 1</b> | Characteristics of devices<br>Data Types                                     | Thinking Abstractly<br>Thinking Ahead<br>Thinking Procedurally<br>Thinking Logically                  | Databases<br>Data Structures                                   | Programming Techniques<br>Recursion<br>Object Orientated Techniques<br>Programming Project – Analysis & Design                                                 |
| <b>Autumn 2</b> | Characteristics of devices (continued)<br>Boolean Algebra<br>Data Structures | Programming Constructs<br>Integrated Development Environment<br>Global & Local Variables<br>Functions | Compression, Encryption & Hashing<br>Application Generation    | Computational Methods Algorithms<br>(Divide & Conquer, Heuristics, Pipelining)<br>Dijkstra Algorithms<br>A* Algorithms<br>Programming Project - Implementation |
| <b>Spring 1</b> | Operating Systems<br>Data Structures (continued)<br>Applications Generation  | Computational Methods<br>Problem Recognition<br>Problem Decomposition                                 | Networks                                                       | Efficiency of Algorithms<br>Programming Project - Implementation (continued)                                                                                   |

|                 |                                                                |                                                                    |                                                        |                                                                   |
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|                 |                                                                | Use of Abstraction<br>Computational Techniques                     |                                                        |                                                                   |
| <b>Spring 2</b> | Software Development<br>Databases<br>Networks                  | Algorithms<br>Web Technologies                                     | Case Studies & Extended<br>Writing<br>Paper 1 Revision | Paper 2 Revision<br>Programming Project -<br>Testing & Evaluation |
| <b>Summer 1</b> | Paper 1 Revision<br>Paper 1 Mock Exam<br>Programming Languages | Project Feasibility Study<br>Paper 2 Revision<br>Paper 2 Mock Exam | Paper 1 Revision                                       | Paper 2 Revision                                                  |

## Skills

Computer Science is a practical subject where students can apply the academic principles learned in the classroom to real world systems. The A Level qualification in Computer Science will equip students with a range of computational thinking and programming skills and provide opportunities to develop, in context, desirable, transferable skills such as analysis, planning, problem solving, review and working with others.

The qualification will enable students to develop:

- valuable thinking and programming skills that are extremely attractive in the modern workplace;
- computational thinking skills and how to apply them;
- the ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so
- problem solving using computers;
- creative thinking skills by creatively, innovatively, analytically, logically and critically solving problems to develop a solution;
- mathematical skills used to express computational laws and processes;
- memory recall skills regarding knowledge of topics on the specification;
- research, analytical and evaluative skills;
- skills that interpret and present information to effectively communicate;
- independent working skills;

- efficient time management skills;
- digital literacy skills to be able to successfully find, evaluate, create and communicate information.

### **Assessment**

This is a linear assessed course with external assessment taking place at the end of Year 13.

There are 2 externally assessed papers, each weighted at 40% :

Paper 1 – Computer Systems

Paper 2 – Algorithms and programming

Students must also complete a Non Examined Assessment (Programming Project) of their choice, weighted at 20% of the final grade.

Further details about the course can be found at: <https://www.ocr.org.uk/qualifications/as-and-a-level/computer-science-h046-h446-from-2015/>