

KS5 Knowledge and Skills (Computer Science)

| Year 12 | Year 13 |
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| Term 1 | Term 1 |
| <p>Intro to Computer Science A-Level</p> <p>H446/02: Algorithms and programming</p> <p>Elements of computational thinking</p> <p>Algorithms to solve problems and standard algorithms</p> | <p>H446/03: Programming Project</p> <p>Developing the solution</p> <p>Evaluation</p> |
| Term 2 | Term 2 |
| <p>H446/02: Algorithms and programming</p> <p>Problem solving and programming</p> | <p>H446/02: Algorithms and programming</p> <p>Elements of computational thinking</p> <p>Algorithms to solve problems and standard algorithms</p> <p>Problem solving and programming</p> |
| Term 3 | Term 3 |
| <p>H446/01: Computer Systems</p> <p>The characteristics of contemporary processors, input, output and storage devices Software and software development</p> | <p>H446/01: Computer Systems</p> <p>The characteristics of contemporary processors, input, output and storage devices</p> <p>Software and software development</p> <p>Exchanging data</p> <p>Data types, data structures and algorithms</p> <p>Legal, moral, cultural and ethical issues</p> |
| Term 4 | Term 4 |
| <p>H446/01: Computer Systems</p> <p>Exchanging data</p> <p>Data types, data structures and algorithms</p> | <p>Exam Preparation</p> <p>H446/2</p> |
| Term 5 | Term 5 |
| <p>H446/01: Computer Systems</p> <p>Legal, moral, cultural and ethical issues</p> | <p>Exam Preparation</p> <p>H446/1</p> |
| Term 6 | Term 6 |
| <p>H446/03: Programming Project</p> <p>Analysis of the problem</p> <p>Design of the solution</p> <p>Developing the solution</p> | <p>Exam Preparation</p> <p>H446/1</p> <p>H446/2</p> |

Overview

| Year 12 | Year 13 |
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| Term 1 | Term 1 |
| <ul style="list-style-type: none"> Understand what is meant by computational thinking: <ul style="list-style-type: none"> Thinking abstractly Thinking ahead Thinking procedurally Thinking logically Thinking concurrently Understand the use of algorithms to describe problems and standard algorithms. | <ul style="list-style-type: none"> Developing the solution: <ul style="list-style-type: none"> Iterative development process Testing to inform development Evaluation: <ul style="list-style-type: none"> Testing to inform evaluation Success of the solution Describe the final product Maintenance and development |
| Term 2 | Term 2 |
| <ul style="list-style-type: none"> Understand how computers can be used to solve problems and programs can be written to solve them (Learners will benefit from being able to program in a procedure/imperative language and object-oriented language.): <ul style="list-style-type: none"> Programming techniques Computational methods | <ul style="list-style-type: none"> Understand what is meant by computational thinking: <ul style="list-style-type: none"> Thinking abstractly Thinking ahead Thinking procedurally Thinking logically Thinking concurrently Understand the use of algorithms to describe problems and standard algorithms. Understand how computers can be used to solve problems and programs can be written to solve them (Learners will benefit from being able to program in a procedure/imperative language and object-oriented language.): <ul style="list-style-type: none"> Programming techniques Computational methods |
| Term 3-4 | Term 3-4 |
| <ul style="list-style-type: none"> Understand components of a computer and their uses: <ul style="list-style-type: none"> Structure and function of the processor Types of processor | <ul style="list-style-type: none"> Understand components of a computer and their uses: <ul style="list-style-type: none"> Structure and function of the processor Types of processor |

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| <ul style="list-style-type: none"> ○ Input, output and storage • Understand the types of software and the different methodologies used to develop software: <ul style="list-style-type: none"> ○ Systems Software ○ Applications Generation ○ Software Development ○ Types of Programming Language • Understand how data is exchanged between different systems: <ul style="list-style-type: none"> ○ Compression, Encryption and Hashing ○ Databases ○ Networks ○ Web Technologies • Understand how data is represented and stored within different structures. Different algorithms that can be applied to these structures: <ul style="list-style-type: none"> ○ Data Types ○ Data Structures ○ Boolean Algebra | <ul style="list-style-type: none"> ○ Input, output and storage • Understand the types of software and the different methodologies used to develop software: <ul style="list-style-type: none"> ○ Systems Software ○ Applications Generation ○ Software Development ○ Types of Programming Language • Understand how data is exchanged between different systems: <ul style="list-style-type: none"> ○ Compression, Encryption and Hashing ○ Databases ○ Networks ○ Web Technologies • Understand how data is represented and stored within different structures. Different algorithms that can be applied to these structures: <ul style="list-style-type: none"> ○ Data Types ○ Data Structures ○ Boolean Algebra • The individual moral, social, ethical and cultural opportunities and risks of digital technology. Legislation surrounding the use of computers and ethical issues that can or may in the future arise from the use of computers: <ul style="list-style-type: none"> ○ Computing related legislation ○ Moral and ethical Issues |
| <p style="text-align: center;">Term 5-6</p> | <p style="text-align: center;">Term 5-6</p> |
| <ul style="list-style-type: none"> • The individual moral, social, ethical and cultural opportunities and risks of digital technology. Legislation surrounding the use of computers and ethical issues that can or may in the future arise from the use of computers: <ul style="list-style-type: none"> ○ Computing related legislation ○ Moral and ethical Issues | <ul style="list-style-type: none"> • Exam Preparation: <ul style="list-style-type: none"> ○ Demonstrate knowledge and understanding of the principles and concepts of computer science, including abstraction, logic, algorithms and data representation • Exam Preparation: |

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| <ul style="list-style-type: none">• Analysis of the problem:<ul style="list-style-type: none">○ Problem identification○ Stakeholders○ Research the problem○ Specify the proposed solution• Design of the solution:<ul style="list-style-type: none">○ Decompose the problem○ Describe the solution○ Describe the approach to testing• Developing the solution:<ul style="list-style-type: none">○ Iterative development process | <ul style="list-style-type: none">○ Apply knowledge and understanding of the principles and concepts of computer science including to analyse problems in computational terms |
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