RAINHILL HIGH SCHOOL

KEY STAGE 5 – COMPUTER SCIENCE

YEAR 12

Term 1
- Intro to Computer Science A-Level
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- H446/02: Algorithms and programming
- Elements of computational thinking
- Algorithms to solve problems and standard algorithms

Term 2
- H446/02: Algorithms and programming
- Problem solving and programming

Term 3
- H446/01: Computer Systems
- The characteristics of contemporary processors, input, output and storage devices Software and software development

Term 4
- H446/01: Computer Systems
- Exchanging data
- Data types, data structures and algorithms

Term 5
- H446/01: Computer Systems
- Legal, moral, cultural and ethical issues

Term 6
- H446/03: Programming Project
- Analysis of the problem
- Design of the solution
- Developing the solution

Term 1

- Understand what is meant by computational thinking:
  - Thinking abstractly
  - Thinking ahead
  - Thinking procedurally
  - Thinking logically
  - Thinking concurrently
- Understand the use of algorithms to describe problems and standard algorithms.

Term 2

- 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.):
  - Programming techniques
  - Computational methods

Term 3-4

- Understand components of a computer and their uses:
  - Structure and function of the processor
  - Types of processor
  - Input, output and storage

- Understand the types of software and the different methodologies used to develop software:
  - Systems Software
  - Applications Generation
  - Software Development
  - Types of Programming Language

- Understand how data is exchanged between different systems:
  - 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:
  - Data Types
  - Data Structures
  - Boolean Algebra

Term 5-6

- 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:
  - Computing related legislation
  - Moral and ethical Issues

- Analysis of the problem:
  - Problem identification
  - Stakeholders
  - Research the problem
  - Specify the proposed solution

- Design of the solution:
  - Decompose the problem
  - Describe the solution
  - Describe the approach to testing

- Developing the solution:
  - Iterative development process

YEAR 13

Term 1
- H446/03: Programming Project
- Developing the solution
- Evaluation

Term 2
- H446/02: Algorithms and programming
- Elements of computational thinking
- Algorithms to solve problems and standard algorithms
- Problem solving and programming

Term 3
- H446/01: Computer Systems
- The characteristics of contemporary processors, input, output and storage devices Software and software development
- Exchanging data
- Data types, data structures and algorithms
- Legal, moral, cultural and ethical issues

Term 4
- Exam Preparation
- H446/2
- Term 5
- Exam Preparation
- H446/1

Term 6
- Exam Preparation
- H446/1
- H446/2

Term 1

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  - Thinking concurrently

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Term 5-6

- Exam Preparation:
  - Demonstrate knowledge and understanding of the principles and concepts of computer science, including abstraction, logic, algorithms and data representation

- Exam Preparation:
  - Apply knowledge and understanding of the principles and concepts of computer science including to analyse problems in computational terms