St Mary's College

COMPUTER SCIENCE (AQA)
Pre-course reading and guidance

Why should I choose Computer Science?

What is Computer Science?

The course is not about learning to use tools or just training in a programming language. Instead the emphasis is on computational thinking. Computational thinking allows us to understand the processes computers have to follow to function.

Why study Computer Science at A-level?

Thinking computationally is an important life skill. Thinking computationally means using abstraction and decomposition. The study of computation is about what can be computed and how to compute it. Computer Science involves questions that have the potential to change how we view the world.

Who should study Computer Science?

If you're a logical person who enjoys a challenge, then it could be for you. Students are typically logically adept and enjoy the challenges that subjects like Mathematics and Physics provide. You should have an interest in the concept of 'computational thinking' and want to *know* why this technology works the way it does, not just accept that it works!

Not sure whether this subject is relevant to you?

› How many times have you needed to use a computer?

› How often do you see new technology being released?

› How many times have you read about statistical modelling?

› Do you want to be valuable to *any* employer later in life?

Why study Computer Science at A-level?

Grade expectations

England, % change in earnings compared with average graduate, five years after graduation
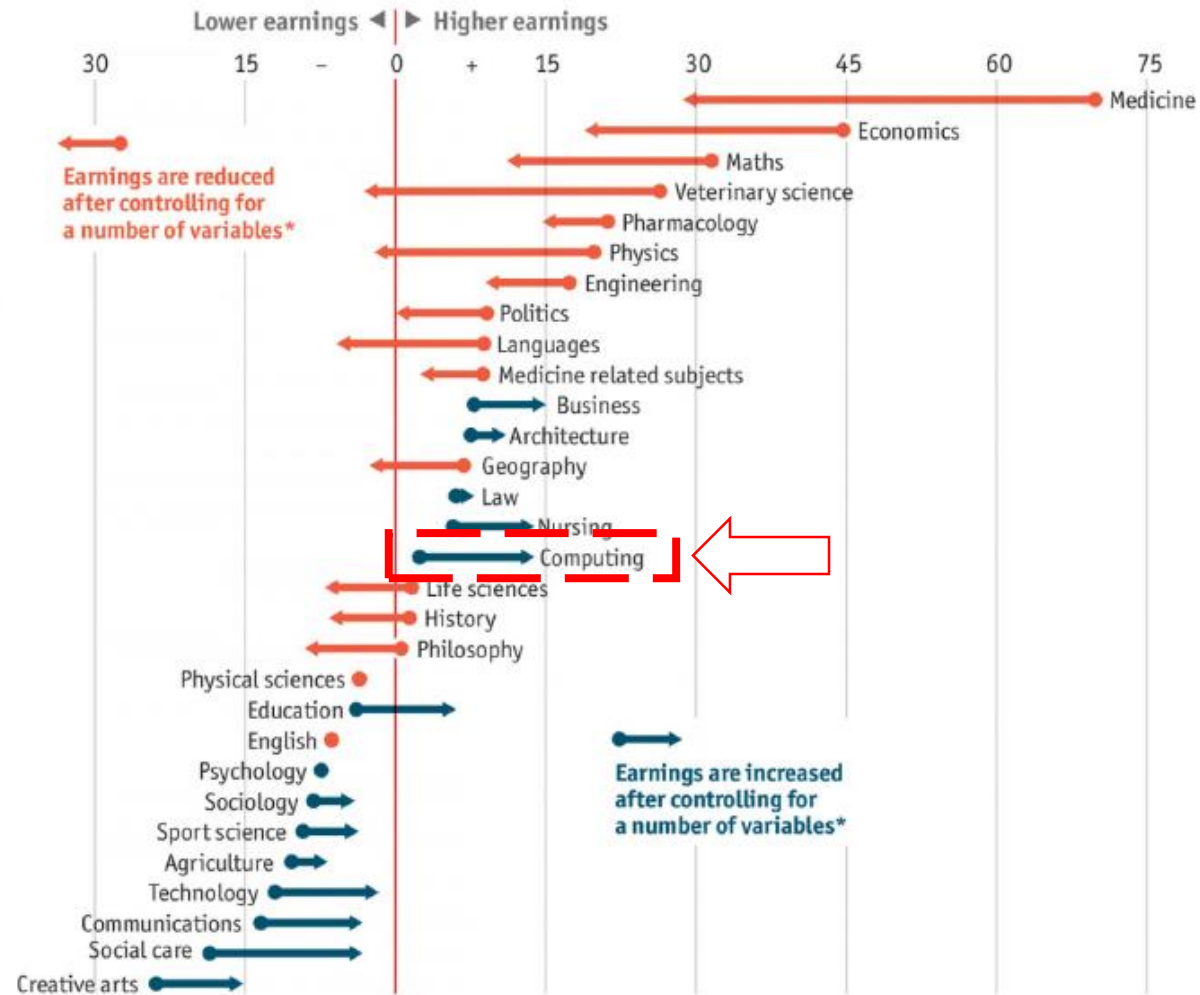
Sources: IFS; *The Economist*

The Economist

Where can this course lead to?

- University 3 Year degree

- Careers in almost any area in the future – every developing industry is crying out for computer scientists!

Course Structure

The course is a two year course.

It consists of two exams, given an equal weighting (40% / 40%) and a programming project (NEA – 20%).

Paper 1

What's assessed: this paper tests a student's ability to program, as well as their theoretical knowledge of Computer Science from subject content 10-13 above and the skills required from section 22 above.

Assessed

- On-screen exam: 2 hours 30 minutes
- 40% of A-level

Questions

Students answer a series of short questions and write/adapt/extend programs in an Electronic Answer Document provided by us.

We will issue Preliminary Material, a Skeleton Program (available in each of the Programming Languages) and, where appropriate, test data, for use in the exam.

Paper 2

What's assessed: this paper tests a student's ability to answer questions from subject content 14-21 above.

Assessed

- Written exam: 2 hours 30 minutes
- 40% of A-level

Questions

Compulsory short-answer and extended-answer questions.

Non-exam assessment

What's assessed: the non-exam assessment assesses student's ability to use the knowledge and skills gained through the course to solve or investigate a practical problem. Students will be expected to follow a systematic approach to problem solving, as shown in section 22 above.

Assessed

- 75 marks
- 20% of A-level

Course Structure

Year 1
Programming skills and fundamentals of computer systems, including:

- Fundamentals of programming, data representation & data structures
- Systematic approach to problem solving
- Fundamentals of computer systems, computer organization & architecture
- Fundamentals of communication and networking

Year 2
Advanced programming skills and enhanced understanding of computer systems, including:

- Object Oriented Programming
- NEA – the programming project
- Consequences of the use of computers
- Big Data
- Functional Programming

Resources to develop your knowledge…

- Exam specification: <u>click here</u>

- Further Reading:
  - Rob Miles's Yellow Book – <u>click here</u>

- Programming prep:
  - CodeWars – <u>click here</u> (you will need to register for an account)
  - CodeCademy – <u>click here</u> (again, register for an account)

Any further questions?

Contact details for the Computer Science teacher:

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