Computer Science Yr10 & Yr11 Roadmap

Yr10 Subject Aim: Students will have 5 x 1 hour long lessons per fortnight. Students will be completing the OCR GCSE in Computer Science J277, first teaching from September 2020. The Yr10 content is as practically based as possible with an emphasis on programming. The programming language that will be learnt is called Python. Students will be able to understand and apply the fundamental principles and concepts of Computer Science, analyse problems, think creatively, logically & critically, understand the components that make up digital systems, understand the impacts of digital technology and apply mathematical skills relevant to Computer Science

	Yr10 AUTUMN TERM TOPICS	ASSESSMENT IN Yr10
AUTUMN TERM	Students will start to learn basic programming principles such as variables, Input & output, sequence, selection and iteration. Students will work through tasks designed to develop and practice basic programming principles to provide confidence to work on more complex programs.	Students will be assessed in two ways. 1). Students will be assessed continually during lesson to ensure that they are able to progress through the practical programming tasks. 2). Students will be given a formal grade for the completion of their homework tasks in line with the GCSE grade scheme.
	Yr10 SPRING TERM TOPICS	**HOMEWORK IN Yr10**
SPRING TERM	Students will continue to build upon the basic programming principles learnt during the previous term and learn additional programming techniques such as the use of arrays, basic file handling and functions & procedures. Students will continue to complete tasks designed to develop and practice additional programming principles as well as being given longer tasks that require students to decompose the task and build solutions iteratively.	Students will usually receive a project-based homework per ½ term. The purpose of the homework is to draw together everything covered in that ½ term. This reinforces the opportunities given to students to undertake programming tasks.
	Yr10 SUMMER TERM TOPICS	**ENRICHMENT THEMES IN Yr10**
SUMMER TERM	Students will learn to build in defensive design techniques into their programs in order to anticipate user misuse and validate user input. They will learn to test their programs that they build to determine how successful their programs are at fulfilling requirements. Towards the end of the summer term students will start to learn how computers store data and how data is manipulated by the Central Processing Unit. This will incorporate learning to convert numbers between Denary, Binary & Hexadecimal and learning Boolean logic by creating simple logic diagrams and creating truth tables.	Going further than the course section on the Computer Science BrightSpace page, this is continually updated with lots of topics throughout the year. Use of IT in the workplace. After school Computing Club: Thursdays in CR1, we would encourage GCSE students to be mentors to KS3 students. See: **Computing Club Brightspace Course Link**

Where Next?

Students will continue to have 5 x 1 hours long lessons per fortnight. The Yr11 content is designed to focus on many of the topics required for the J277/01: Computer Systems part of the course in addition to covering the remaining aspects of J277/02: Computational Thinking, Algorithms & Programming that have not yet been covered.

Computer Science Yr11 Roadmap on Next Page

Computer Science Yr10 & Yr11 Roadmap

Yr11 Subject Aim: Students will have 5 x 1 hour long lessons per fortnight. Students will be completing the OCR GCSE in Computer Science J277, first teaching from September 2020. The Yr11 content is designed to focus on general Computer Systems content in order to prepare for the two exams to be taken at the end of the academic year. Learners will be introduced to the Central Processing Unit, memory and storage, networks, system security & system software. Students will also become familiar with the impact of Computer Science in a global context.

	Yr11 AUTUMN TERM TOPICS	ASSESSMENT IN Yr11
AUTUMN TERM	Students will learn about Data Representation & Computational logic. They will learn how data is manipulated by the Central Processing Unit. Students will learn about Systems architecture to understand how the CPU processes data and instructions in order to run software. Students will learn how computers use Memory & Storage to understand how computers store programs in long term memory and store data and instructions in RAM. Students will learn the importance of Systems Software. Software that allows a computer to operate in an expected manner.	Students will be assessed by regular end of topic assessments. Each topic usually lasts around 3 weeks. Students can expect to have between 6 & 10 end of topic assessments. Some end of topic assessment can be combined depending upon time. After Easter you are likely to have two mock exams.
	Yr11 SPRING TERM TOPICS	**HOMEWORK IN Yr11**
SPRING TERM	Students will learn about Computer Networks learning how computers can be connected together and how data is shared between computers over a network. Students will learn about Systems Security to understand the threats posed to a computer network and how to prevent threats. Students will learn standard searching and sorting Algorithms that can be utilised by a computer program to search and sort data. Students will learn about Translators in order to understand how a computer program can be written in a high-level language and be interpreted into a low-level language to run on a computers processor.	Students will usually receive a topic to research and produce notes for over each ½ term. There will be regular homework's for students to revise for each end of topic assessment.
	Yr11 SUMMER TERM TOPICS	**ENRICHMENT THEMES IN Yr11**
SUMMER TERM	Students will use this time to revisit topics before the GCSE exams.	Going further than the course section on the Computer Science BrightSpace page, this is continually updated with lots of topics throughout the year. Use of IT in the workplace. After school Computing Club: Thursdays in CR1, we would encourage GCSE students to be mentors to KS3 students. See: **Computing Club Brightspace Course Link**

Where Next?

Enterprise A Level Options: The enterprise department teach two subjects at A Level from which students studying Computer Science would find appropriate.

- A Level Computer Science
- Cambridge Technical L3 IT

Contacts

Enterprise Department: Based in the Enterprise Office (the Portakabin in the quad next to the main hall, up the ramp, room 27). Student issues - please do not hesitate to ask for help (Computing Teacher or at the Enterprise Office). We also run "drop-in" sessions (open to students for any help / questions etc.) in CR3 on Monday, Tuesday and Wednesday after school