

## Computing Department

It is the aim of the department to enable students to develop skills and knowledge in Computer Science, Information Technology and Digital Literacy which will prepare them for further education, employment and a world where the use of digital technology is fully embodied. We wish to enthuse students to have an understanding far deeper than the interfaces and devices that they currently operate as part of their everyday life.

It is our intention to enable students to develop a love of learning for the subject and an understanding that there are no limits to their own development in Computing which will equip them with life skills such as problem solving, use of software packages, an understanding of online risks and the ability to tackle the challenges that come with living in our digital world.

As a department we have a responsibility to ensure that our students are prepared for the digital age we live in and the use of technology which is all around us. Students will be given the opportunity to develop their computer coding and digital technology skills which will allow them to take their studies onto KS4 and to Further and Higher education if they desire and ultimately secure a career within a large range of industries.

### Program of Study

#### Key Stage 3

Year 7		Year 8		Year 9	
Term	Topic	Term	Topic	Term	Topic
1	Networks and the Internet/WWW	1	Online safety – Malware threats	1	Online Security, preventing threats
2	Online Safety		Networks and the Internet		Emerging technologies e.g. VR, AR, AI, wearable tech etc
	Programming art with Python Turtle	2	App Development	2	Project based programming using Microbits
3	Using MS Access to process and analyse data	3	3D Design – houses of the future	3	Project Management – design and develop a website
	Computer Hardware – Input, Output and Storage	4	Programming – how are commercial systems designed?	4	Computer Systems – programming
4	Computer Systems – different computers for different users		Computer Systems – the future of computers	5	Using relational databases in Access to analyse and process data
	Programming an Interface	5	Data analysis using MS Excel - Financial modelling		Programming – computer accessibility
5	Using MS Excel to process and analyse data		Website development	6	Using Excel to analyse survey results
6	Programming – beat Minecraft	6	Desktop Publishing – magazine creation		

#### Homework:

Students work towards achieving their bronze and silver IDEA awards

## Key Stage 4

Students have the opportunity to study two Computing subjects at GCSE level:

### Computer Science GCSE

GCSE in Computer Science is engaging and practical, encouraging creativity and problem solving. It encourages students to develop their understanding and application of the core concepts in Computer Science. Students also analyse problems in computational terms and devise creative solutions by designing, writing, testing and evaluating programs.

#### Year 10

	Unit	Theory	Practical
<b>Term 1</b>		Systems Architecture	Sequence, Selection, Iteration
<b>Term 2</b>		Memory & Storage	Data Structures and Functions
<b>Term 3</b>		Computer networks, connections and protocols	Libraries, Testing & Defensive design
<b>Term 4</b>		Network Security	File Access
<b>Term 5</b>		System Software	Programming Project
<b>Term 6</b>		Ethical, legal, cultural and environmental concerns	Programming Project

#### Year 11

	Unit	Theory	Practical
<b>Term 1</b>		Sorting & Searching Algorithms	Algorithms
<b>Term 2</b>		Producing robust programs & data representation	Advanced Testing & Defensive design
<b>Term 3</b>		Computational logic	Algorithms
<b>Term 4</b>		Translators and facilities of languages	Algorithms
<b>Term 5</b>		<b>Revision</b>	<b>Revision</b>
<b>Term 6</b>		<b>Examinations (2 paper)</b>	<b>Examinations (2 papers)</b>

## OCR Cambridge National Certificate in Information Technologies

IT offers essential skills for life beyond school. To quote the Marketing Director of one of the largest UK insurance companies as an employer we look for “a good mix of IT, Maths and English... communication, project management, data handling and analysis skills ... vital for digital growth”. The Government talk about a “Huge Digital Skills Gap”, something that this qualification could help to address.

People with a knowledge of Cyber Security, Big Data, Project Management and Emerging Technologies are in demand. Information Technology careers are fast-moving with plenty of chances of promotion, and demand for IT professionals is surging. In this digital age, the ability to use IT is paramount. In every walk of life, the way we work, learn and socialise has been affected by the digital revolution. Whichever path you decide to follow when you leave school, you will need IT skills; Further Education, universities and employers will expect this.

### Year 10

	Unit	Theory	Practical
Term 1	<b>RO12 Understanding tools, techniques and processes for technological solutions</b>	The project lifecycle	Project Management Tools
Term 2		Data and Information	The use of IT to collect and process data
Term 3		Cyber Security	Threats – types and prevention
Term 4		Software tools	Presenting information, distribution methods, hardware software and connection requirements
Term 5		<b>Revision</b>	<b>Exam – RO12 Understanding tools, techniques and processes for technological solutions</b>
Term 6	<b>RO13 Developing Technological Solutions</b>	Software Skills	Project Management – Gantt charts

### Year 11

		Theory	Practical
Term 1	<b>RO13 Developing Technological Solutions</b>	Microsoft Excel	Worksheets, formulas, functions, macros, importing and exporting data
Term 2		Microsoft Access, PowerPoint, Publisher	Relational databases, advanced PowerPoint and Publisher tools
Term 3		Coursework	Controlled Assessment - RO13 Developing Technological Solutions
Term 4		Coursework	
Term 5		<b>Revision for resit if required</b>	<b>Exam – RO12 Understanding tools, techniques and processes for technological solutions</b>
Term 6		General Revision	

## Key Stage 5

### Computer Science A Level

The A Level Computer Science qualification helps students understand the core academic principles of Computer Science. Classroom learning is transferred into creating real-world systems through the creation of an independent programming project. This qualification will develop the students' technical understanding and their ability to analyse and solve problems using computational thinking.

#### Year 12

	Theory	Topics	Practical element
<b>Term 1</b>	<b>Component 1 – Computer systems</b>	The internal workings of the CPU	C# Development
<b>Term 2</b>		Software and software development	OO Programming and Virtual Reality
<b>Term 3</b>		Exchanging data	Advanced OO programming
<b>Term 4</b>		Data types, data structures and algorithms	Software Project Management
<b>Term 5</b>		Legal, moral and ethical issues	Programming Project
<b>Term 6</b>	<b>Component 2 – Algorithms and Programming</b>	Elements of computational thinking	Programming Project

#### Year 13

	Theory	Topics	
<b>Term 1</b>	<b>Component 2 – Algorithms and Programming</b>	Problem solving and programming	Programming Project
<b>Term 2</b>		Algorithms to solve problems and standard algorithms	Programming Project
<b>Term 3</b>	Exam revision and exam technique	Revision	Programming Project
<b>Term 4</b>	Exam revision and exam technique	Revision	
<b>Term 5</b>	Exam revision and exam technique	Revision	
<b>Term 6</b>	Exam revision and exam technique	Revision	

## OCR Level 3 Cambridge Technicals in Information Technology

This qualification is not just about being able to use computers. Employers have stated that they need people who are able to help them develop their systems or the systems for their customers, use IT as a tool to analyse data and develop applications. Therefore, this qualification is designed to give a range of specialist knowledge and transferable skills in the context of applied IT, providing students with the opportunity to enter University, move directly into employment, or progress to a related apprenticeship course. Made up to 2 examined units taken in Year 12 and 3 coursework units completed in Year 13.

### Year 12

	Theory	Topics
<b>Term 1</b>	Unit 1 LO1-LO2	Computer hardware and software
<b>Term 2</b>	Unit 1 LO3- LO5 Exam revision, technique and practice	Business IT systems, employability and communication IT skills used in an IT environment and ethical and operational issues and threats to computer systems
<b>Term 3</b>	Unit 2 LO1-LO3	Unit 1 Exam. Unit 2 - Holders and uses of global information, big data, WWW technologies, the styles, classification and management of global data
<b>Term 4</b>	Unit 2 LO3-LO6 Exam revision	The legal framework governing the storage and use of information, the process flow of information and the principles of information security. Categories of information, data analysis tools, information systems structure and green IT
<b>Term 5</b>	Unit 2 Exam revision, technique and practice.	Unit 2 Exam (Unit 1 resit if required)
<b>Term 6</b>	Coursework Units 6,9 and 21 Combined project	<b>App design, product development and website prototyping</b> Key phases of application development. Application models (e.g.: Rapid, Agile, Waterfall etc). The impact of constraints on product development

### Year 13

	Theory	Practical - Coursework
<b>Term 1</b>	Coursework Units 6,9 and 21	Website components and security risks, client requirements
<b>Term 2</b>	Coursework Units 6,9 and 21	Feasibility report, website designs, gather client feedback and website creation
<b>Term 3</b>	Exam resits if required Coursework Units 6,9 and 21	Revision if required Test the website and present it to the client followed by final evaluation.
<b>Term 4</b>	Coursework/Revision	Improvements to coursework or revision for exam resits
<b>Term 5</b>	Exam resits if required	Revision
<b>Term 6</b>		