Cambridge National in IT

Year 11 Options

What are the aims and intentions of this curriculum?

The aim of our Key Stage 4 Curriculum is to encourage students to: understand and apply the fundamental principles and concepts of IT, including the use of IT in the digital world, Internet of Everything, data manipulation and Augmented Reality. Students will understand, apply and use IT appropriately and effectively for the purpose and audience, develop learning and practical skills that can be applied to real-life contexts and work situations. Students will learn to think creatively, innovatively, analytically, logically and critically. Students will develop independence and confidence in using skills that would be relevant to the IT sector and more widely, plan, design, create, test and evaluate/review IT solutions and products which are fit for purpose. They will understand the importance of meeting user/client requirements and apply design and Human Computer Interface (HCI) considerations appropriate for a defined audience, understand the impacts of digital technologies on the individual, organisation and wider society.

Term	Topics	Knowledge and key terms	Skills developed	Assessment
Summer 2	**OCR RO70** **Theme:** **Using Augmented Reality to present information**	This unit is similar to the RO60 controlled assessment. The advantage of this unit are students are expecting to combine their knowledge of project planning and what they have learned from submitting their Data Manipulation project. The coursework format will be familiar to the students as well as the AR software. **Planning and design considerations** • what augmented reality is and how it is different to virtual reality. • Get the students to research the different uses of AR in the different sectors and how AR is used. • the different types of AR **Purpose** User Requirements Target Audience	Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users - Explain how different operating systems enable different interactions. - Explain the advantages and disadvantages of each type of design tool. - Explain the importance of the action flow to navigate the layers - Explain the differences between a static an interactive layer.	**Fixed Controlled Assessment**

		Content **Assets** • Assets • Charts and graphs • Hyperlinks / weblinks **Text** • Assets • Audio • Video • Photographs / images **Layers / User Interaction** • Triggers • Object recognition / marker-based • Location (GPS) based / Markerless • Superimposition • Layers/user interaction • Action flow • Static interactive • the purpose of layers and how users can interact with augmented reality and navigate through the layers • the types of triggers that could be used and for what purpose • the type of user interaction for navigating then layers and initiating the triggers • how they have considered the action flow of the AR app design • whether they are using static, interactive or both forms of user interaction and layers.	- The legal rights and responsibilities regarding equality (particularly with reference to the protected characteristics as defined in the Equality Act 2010) and that everyone is unique and equal. - About online risks, including that any material someone provides to another has the potential to be shared online and the difficulty of removing potentially compromising material placed online. - Not to provide material to others that they would not want shared further and not to share personal material which is sent to them. - The characteristics of positive and healthy friendships (in all contexts, including online) including: trust, respect, honesty, kindness, generosity, boundaries, privacy, consent Programmer Software Engineer Robotics Engineer	

		• Components • Flow charts • Mind maps • Mood boards • Introduce the final three different types of design tools and their components • Summarise the software that can be used to create the different design tools		
Autumn 1	**OCR RO70** **Theme: Using Augmented Reality to present information**	**Augmented Reality (AR)** • Purpose • Sectors • Uses • Training • Virtual tours • Visualisation • Marketing • Object recognition • Marker-based • Location based • Markerless • Superimposed • User interaction Layers • Static	- Explain how different operating systems enable different interactions. - The legal rights and responsibilities regarding equality (particularly with reference to the protected characteristics as defined in the Equality Act 2010) and that everyone is unique and equal. - About online risks, including that any material someone provides to another has the potential to be shared online and the difficulty of removing potentially compromising material placed online. - Not to provide material to others that they would not want shared further and not to share personal material which is sent to them. - The characteristics of positive and healthy friendships (in all contexts, including online) including: trust, respect, honesty,	**Fixed Controlled Assessment** Using Augmented Reality to present information

		Interactive • Mobile devices • Smart devices • Laptop / PC **Designing an AR model prototype** • User requirements • Purpose • Target audience • Content • Assets • Charts and graphs • Hyperlinks/weblinks • Text • Audio • Video • Photographs / images • Triggers • Object recognition/marker-based • Location (GPS) based / Markerless • Superimposition • Layers/user interaction	kindness, generosity, boundaries, privacy, consent Programmer Software Engineer Robotics Engineer	

		• Action flow • Static Interactive		
Autumn 2	**OCR RO70** **Theme:** **Using Augmented Reality to present information**	**Creating an AR model prototype** • what a prototype is and its importance • the different types of prototypes and their purpose • the characteristics of a prototype • the most appropriate prototype for the design and development of an AR app. • ways in which a prototype could be created. • Triggers • Characteristics • Unique • Object recognition • Marker-based • Location based • Markerless • Superimposition • Single layers • Multiple layers • Access to layers • Static • Interactive	Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users - Explain how different operating systems enable different interactions. - The legal rights and responsibilities regarding equality (particularly with reference to the protected characteristics as defined in the Equality Act 2010) and that everyone is unique and equal. - About online risks, including that any material someone provides to another has the potential to be shared online and the difficulty of removing potentially compromising material placed online. - Not to provide material to others that they would not want shared further and not to share personal material which is sent to them. - The characteristics of positive and healthy friendships (in all contexts, including online) including: trust, respect, honesty, kindness, generosity, boundaries, privacy, consent	**Fixed Controlled Assessment** Using Augmented Reality to present information. **Coursework will be submitted at the end of this term.**

		• Swipe • Click/select • Voice **Testing and reviewing** • Technical testing • User testing • Test plan • Test number • Expected result • Actual result • Remedial action • Effectiveness • Processes • Tools • Techniques • Defined purpose	Programmer Software Engineer Robotics Engineer	
Spring 1	**OCR RO50** **Theme:** **IT in the digital world**	After completing their coursework, Students will be practicing for their written exam. You could: • Consider non-standard users Identify the input and • Output devices required for each interaction method Explain the levels of processing power required for different HCIs.	Students will be given print subject content books to help them revise. They will be tested in different formats to help build their knowledge. - Explain what processing resources are required for a HCI. - Explain how users interact with computer systems. - Explain the advantages and disadvantages of each interaction method.	Test Questions

		• Identify all the ways that humans can interact with a computer system
		
		Assess how existing HCIs operate and look on different Operating Systems.
		• Students compare the HCI used on:
		  ○ Windows based machines
		  ○ Android based machines
		  ○ OS/iOS based machines
		• Students compare the difference between mobile and desktop versions
		• Students look at consistencies / differences between the HCIs.
			- Explain how different operating systems enable different interactions.	

Spring 2	**OCR RO50** **Theme:** **IT in the digital world**	In small groups students research how HCI is used in each of the following areas: • Banking • Embedded systems • Entertainment For each of the areas a group of students could produce • Visualisation Diagrams of at least 3 examples of a HCI that is used in that area • an HCI in the selected examples. The groups can then share the research that they gathered. Consider non-standard users Identify the input and • output devices required for each interaction method How humans interact with different devices.	- Explain how different operating systems enable different interactions. - Explain the levels of processing power required for different HCIs. - - Explain how different operating systems enable different interactions. - How different devices enable different interface designs and interactions. - Explain the use of the - Explain how different digital platforms have different interface designs and components. - Explain the difference between data and information. - Explain the different types of data that can be used in different contexts.	Guide to flowchart symbols, from basic to advanced (gliffy.com) 3 Basic Types of Mind Maps (edrawsoft.com) Visualisation Diagrams (lakelandscomputing.com) What Is a Wireframe & How to Design Them: A Beginner's Guide (designshack.net) Compare the 10 best mind mapping software of 2021 (thedigitalprojectmanager.com) Flowchart software (lucidchart.com) 10 best online flowchart software of 2021

		• Identify all the ways that humans can interact with a computer system
		Assess how existing HCIs operate and look on different Operating Systems.
		• Students compare the HCI used on:
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		  ○ OS/iOS based machines
		• Students compare the difference between mobile and desktop versions
		• Students look at consistencies / differences between the HCIs.
		
		Students can continue with their research looking at existing HCI for different digital platforms.
		• Identify the consistencies / differences between the HCI for
		  ○ Database
		  ○ Mobile Apps
		  ○ Spreadsheet
		  ○ Website.
		Look at what data is and what information is. The lesson explores how data is converted into information.
		• Identify the differences between data and information
		• Identify how data is converted into information
		• Identify the different types of data that exist
		Knowledge organisers of the different types of data and the characteristics
			- Explain the reason for using those types of data.
			- Explain the difference between validation and verification.
			- Explain the importance of using validation and verification tools. Describe how validation and verification tools are used in different contexts.
			- Explain why the HCIs are different to meet the needs of the platforms' users.
				(thedigitalprojectmanager.com)
				
				10 tools for creating infographics and visualisations (moz.com)
				
				Transform the way you design software (mockflow.com)
				
				Life's too short for bad software!
				
				Flow charts
				Create Presentations, Infographics, Design & Video (visme.co)
				
				Wireframes
				The go to free online wireframing tool (wireframe.cc)
				The differences in wireframe fidelity: from low to high fidelity wireframes (blog.hubspot.com)
				
				The Alan Turing Institute human computer interaction theory (turing.ac.uk)
				
				Adobe human computer interaction information (xd.adobe.com) Adobe human computer interaction information)
				
				BBC Bitesize Human computer interfaces (HCI) (bbc.co.uk)
				
				A guide to human computer interface (softwaretesttips.com)

Summer 1	**Theme:** **Online Safety**	In this short unit students are reminded about staying safe online, using emails, social media and completing tasks remotely.	Developing Skills to remaining safe while online including using online communication tools correctly.	Year 11 Online Safety Baseline test Multiple –Choice Online Tests Read Vocabulary

		- Acceptable use policy - File types - Naming conventions - File management - Backup - Social networking - Cyberbullying - Privacy - Password - Identify theft - Phishing - Search engine cookies - Gambling - Sexting - Grooming - pornography - PIN - AI - Honesty - Integrity - Ways to use technology safely - Create, reuse, revise and repurpose digital artefacts - The benefits of strong passwords - The concept of the digital footprint - The positive and negative impact of social media - The relationship between the internet and social media A basic understanding of the relevant legislation	- Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise acceptable/unacceptable or inappropriate content, contact, conduct or behaviour and know how to report concerns. - The characteristics of positive and healthy friendships (in all contexts, including online) including: trust, respect, honesty, kindness, generosity, boundaries, privacy, consent and the management of conflict, reconciliation and ending relationships. This includes different (non-sexual) types of relationship. - Their rights, responsibilities and opportunities online, including that the same expectations of behaviour apply in all contexts, including online. - About online risks, including any material someone provides to another has the potential to be shared online and the difficulty of removing potentially compromising material placed online. - That in school and in wider society they can expect to be treated with respect by others, and that in turn they should show due respect to others, including people in positions of authority	**Websites:** Office 365 https://unsplash.com/ https://www.canva.com/en_gb/ https://www.google.co.uk/intl/en-GB/drive/ **Websites:** www.bbc.co.uk/bitesize/guides/z36nb9q/revision/2 www.nibusinessinfo.co.uk/content/benefits-computer-networks https://beinternetawesome.withgoogle.com/en_uk www.speedtest.net www.youtube.com/watch?v=Dxcc6ycZ73M www.submarinecablemap.com www.youtube.com/watch?v=ewrBalT_eBM lifehacks.io/facts-about-the-internet www.youtube.com/watch?v=ZTM9GA-4nBA seotribunal.com/blog/google-stats-and-facts https://www.bbc.co.uk/bitesize/topics/z67ncdm www.lifewire.com/most-common-tlds-internet-domain-extensions-817511 www.yougetsignal.com/tools/network-location/ **Knowledge Organiser** ICT Extra help booklet

			and due tolerance of other people's beliefs. - About different types of bullying (including cyberbullying), the impact of bullying, responsibilities of bystanders to report bullying and how and where to get help. - That some types of behaviour within relationships are criminal, including violent behaviour and coercive control. How information and data is generated, collected, shared and used online. - The similarities and differences between the online world and the physical world, including: the impact of unhealthy or obsessive comparison with others online (including through setting unrealistic expectations for body image), how people may curate a specific image of their life online, over-reliance on online relationships including social media, the risks related to online gambling including the accumulation of debt, how advertising and information is targeted at them and how to be a discerning consumer of information online. Network manager/IT Technician	