Level 1/Level 2 Cambridge National in IT (Cambridge OCR J836): Long term overview

KS4 option: students will study aspects of information technology and computer science at sufficient depth to allow them to progress to higher levels of study or to a professional career.

Students will be taught to:

- develop their capability, creativity and knowledge in computer science, digital media and information technology
- develop and apply their analytical, problem-solving, design, and computational thinking skills
- understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns.

Source: DfE Computing

Performance Objectives:

PO1. Recall knowledge and show understanding (exam only)
PO2. Apply knowledge and understanding
PO3. Analyse and evaluate knowledge, understanding and performance
PO4. Demonstrate and apply skills and processes relevant to the subject area. (coursework only)

Source: Specification, page 15

Units of study:

- **R050** IT in the digital world — exam, set and marked by OCR
- **R060** Data manipulation using spreadsheets — non-exam assessment (NEA). Assessed at Chace, moderated by OCR.
- **R070** Using Augmented Reality to present information — NEA

Year 10	**Topic area** Synoptic teaching for all three units.	**Knowledge & Skills**	**Assessment**
Autumn 1	**R050**: 1 - Design tools (1.1 Types of design tools)	• Know the components of each design tool • Know the type of software that can be used to create each design tool • Advantages and disadvantages of each design tool • Creating an original document using relevant design tools either using software or by sketches • Assessing the suitability of an original document to a given context	Formative ✓ Retrieval practice. ✓ Frequent checking of understanding. ✓ Self-assessment (recorded using green pen)

Year 10	Topic area Synoptic teaching for all three units.	Knowledge & Skills	Assessment
	R060: 1 - Planning and designing the spreadsheet solution (1.1 Design tools)	● Produce design documents to create the spreadsheet solution including: ○ Functionality ○ Navigation system ○ Outputs from the system ● Selection and use of appropriate software tools and techniques to effectively plan the spreadsheet solution	
	R070: 2 - Designing an AR model prototype (2.1 Planning and design consideration, 2.2 Design tools)	● Explain the purpose and user requirements of an AR product (and its target audience). ● Identify the content and assets (and its quality) required to create an AR product ● Explain the triggers and user interactions required for an AR product (Marker-based, markerless, superimposition) ● Use of appropriate design tools to support the creation of an AR product, including: ○ Content design ○ Action design ○ House style	
Aut2	**R050**: 2 - Human Computer Interface in everyday life (2.1 Purpose, importance and use of HCI in application areas, 2.2 Hardware considerations, 2.3 Software consideration, 2.4 User interaction methods)	Application areas include: banking; embedded systems; entertainment; fitness; home appliances; retail. ● Know the purpose of HCI, why it is used and its importance to each application area, considering advantages and disadvantages. ● Hardware and software considerations for an HCI ● Know how a user will interact with the HCI, considering advantages and disadvantages.	Formative ✓ Retrieval practice. ✓ Frequent checking of understanding. ✓ Self-assessment (recorded using green pen)

Year 10	Topic area Synoptic teaching for all three units.	Knowledge & Skills	Assessment
	R050: 3 - Data & Testing (3.1 Information & data, 3.2 Data use	● Difference between data and information ● Characteristics of defined data types and to conclude for its best application to a given context. ● Difference between validation and verification ○ Respective tools available to reduce user errors	
	R060: 1.2 HCI design conventions and principles (1.2.1 Functionality, 1.2.2 Types of outputs,1.2.3 HCI navigation)	● Design the functionalities for the solution (calculations, sorting, filtering) ● Design the calculations using flowcharts to enable others to understand calculations taking place ● Design meaningful messages to be displayed to end users for data entry, data validation, and for when errors occur.	
Spr1	**R060**: 2 Creating the spreadsheet solution (2.1.1 Data handling & manipulation, 2.1.2 Techniques to generate the outputs, 2.1.3 User interface)	● Competency with a series of intermediate key skills including data entry, formatting, using formulas and functions, creating charts, sorting and filtering data, and using pivot tables. ● Create an interface which is fit for purpose using buttons, hyperlinks, and macros.	Formative ✓ Retrieval practice. ✓ Frequent checking of understanding. ✓ Self-assessment (recorded using green pen)
	R060: 3 - Testing the spreadsheet solution (3.1 Test the user interface and technical aspects of the spreadsheet solution)	● Series of technical and usability tests throughout development, fully documented.	
	R060: 4 - Evaluating the spreadsheet solution (4.1 Methods used to evaluate)	● Review of outcomes contrasted alongside client requirements.	
Spr2	**R060**: NEA Assessment (working on)	● Development of live NEA following dry-run of sample assessment material.	

Year 10	Topic area Synoptic teaching for all three units.	Knowledge & Skills	Assessment
	R070: 1 - Augmented Reality (AR) (1.1 Purpose and uses of AR, 1.2 Types of AR and user interaction, 1.3 Devices used with AR)	● Know who uses AR and how ● Know the types including: Object recognition / Marker-based; Location based / Markerless; Superimposed	
Sum1	**R060**: NEA Assessment (working on)		**R060**: NEA Assessment (submit for moderation) Formative Retrieval practice. Frequent checking of understanding. Self-assessment (recorded using green pen) **R050**: Year 10 EoY exam
	R050: 3 Data and testing (3.3 Data collection methods, 3.4 Storage of collected data)	● Primary and secondary data collection methods and their advantages and disadvantages ● Logical and physical storage locations: characteristics with advantages and disadvantages.	
	R050: 5 - Digital communications (5.1 Types, 5.2 Software, 5.3 Digital devices, 5.4 Distribution channels, 5.5 Audience demographics)	● Advantages and disadvantages of common types of communication, assessed within a given context ● Characteristics of, advantages and disadvantages, and conclusion of suitability of the following: software; common digital devices; common digital distribution channels; computer networks.	
	R070: 2 - Designing an AR model prototype (2.1 Planning and design consideration, 2.2 Design tools)	● Planning an AR product with consideration of purpose and user requirements, target audience, procurement of content and assets prior to development. ● Use of appropriate design tools to support the creation of an AR product	
Sum2	**R050**: 6 - Internet of Everything (IoE) (6.1 Use of IoE, 6.2 Application areas in everyday life)	● Know the four pillars of IoE technology and understand the interaction between them ● Advantages and disadvantages of the IoE applied to defined areas of application	
	R070: 3 - Creating and AR model prototype (3.1 AR model prototype, 3.2 Triggers, 3.3 Layers/ user interaction, 3.4 Information output)	● Develop a model prototype to demonstrate the working functionality of the AR product according to a brief.	

Year 11	Topic area Synoptic teaching for all three units.	Knowledge & Skills	Assessment
Aut1	**R070**: Recap - 2 - Designing an AR model prototype (2.1 Planning and design consideration, 2.2 Design tools)	• Planning an AR product with consideration of purpose and user requirements, target audience, procurement of content and assets prior to development. • Use of appropriate design tools to support the creation of an AR product	Formative ✓ Do Now! starters and plenaries as retrieval practice. ✓ Frequent checking of understanding. ✓ Self-assessment of class activities (recorded using green pen)
	R070: Recap - 3 - Creating and AR model prototype (3.1 AR model prototype, 3.2 Triggers, 3.3 Layers/ user interaction, 3.4 Information output)	• Develop a model prototype to demonstrate the working functionality of the AR product according to a brief.	
	R070: 4 - Testing and reviewing (4.1 Testing, 4.2 Reviewing the process of creating the AR model prototype)	• Carrying out testing to ensure the AR model prototype works as intended and can be used as intended • How to create a test plan, record test results and when to carry out remedial action	
Aut2	**R070**: NEA Assessment (working on)		
	R050: Recap 3 - Testing		
Spr1	**R070**: NEA Assessment		**R070**: NEA Assessment (submit for moderation)
	R050: 3 - Data and testing (3.5 Application of testing to a range of contexts)	• Know why testing is needed; the effects of not testing on the final product; advantages and disadvantages. • Technical and user testing; advantages and disadvantages of each. • Role of each type of test data (valid, invalid (erroneous) and extreme).	Formative ✓ Rubric to assess project-based programming work.

Year 11	Topic area Synoptic teaching for all three units.	Knowledge & Skills	Assessment
	R050: 4 – Cyber security & legislation 4.1. Threats. 4.2. Impact	● Definitions of each type (DoS — denial of service; hacking; malware; social engineering. ● How to mitigate against threats	
Spr2	**R050**: 4 - Cyber-security and legislation (4.2 impact of attacks, 4.3 Prevention measures, 4.4 Legislation related to the use of IT systems)	●	
	R050: Exam Revision	● Targeted consolidation and revision of R050	Formative ✓ Practice exam questions from PO1, PO2 and PO3. ✓ Self and Peer assessed and then recorded for posterity.
Sum1	**R050**: Exam Revision	● Targeted consolidation and revision of R050	
	R050 ● Written examination, worth 70 marks, representing 40% of the total marks. 90 minutes. ● Section A – worth 15 marks. Includes closed response, multiple choice and short response questions. ● Section B – worth 55 marks. Includes scenario based short, medium and extended response questions. One question will be a create style question [8 marks]. One extended response question [9 marks] will be assessed using a levels of response mark scheme.		