

Year 12: BTEC Level 3 National Extended Certificate in Computing

Unit	Title	Exam or Internal Assessment
2	Fundamentals of Computer Science	Exam
7	IT Systems Security and Encryption	Internal Assessment

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topics	Unit 2 Topics C & D: How data is represented and organised Foci: Number Systems Binary Arithmetic Representing: - Text - Images Data structures Indices & Matrices	Unit 2 Topic A: Hardware & Software Foci: Hardware & components Factors affecting choice of hardware & software Role of OS Kernel Data Processing	Unit 2 Topic B: Computer Architecture Foci: Architectures Micro-architecture Register & Handling Interrupts	Unit 2 Topic E: How data is transmitted Foci: Connection methods Packets & protocols Encryption Error detection & correction	Unit 2 Exam Preparation Foci: Past Papers	Unit 1 Topics A & B: Computational Thinking & Algorithms Foci: Decomposition Pattern recognition Abstraction Flowcharts Pseudocode
	Unit 7 Topic A: Threats to and security of IT systems & legal implications Foci: Threat types Computer network-based threats Information security Legal requirements Impact of security breaches	Unit 7 Topic B: Protecting data through cryptography Foci: Cryptographic principles Cryptographic methods Applications of cryptography	Unit 7 Topic C: Protecting an IT system from security threats Foci: Assignment work Physical security Policies and procedures Software-based protection	Unit 7 Topic D: Implement strategies to protect an IT system from security threats Foci: Group policies Anti-malware Firewall config Wireless security Access control Testing & reviewing	Unit 7 Topic D: Implement strategies to protect an IT system from security threats Focus: Assignment work	Unit 7 Topic D: Implement strategies to protect an IT system from security threats Focus: Assignment work
Assessments	Unit 2 End of Topic Test for Topic A	Unit 2 End of Topic Test for Topic B	Unit 2 End of Topic Test for Topics C & D	Unit 2 End of Topic Test for Topic E	Unit 2 External Examination	
		Unit 7 Assignment 1 –cyber security threats and cryptography			Unit 7 Assignment 2 – Protecting computer systems against threats	
Building on Prior Learning	Substantive Knowledge – From Year 11 students will draw on knowledge of hardware, software, networks & security. The year 12 programme of study then builds on this looking at factors affecting choice of Hardware & Software, the OS kernel, data transmission in Unit 2 and security and encryption in Unit 7. Disciplinary/procedural Knowledge – From Years 10 & 11, students will be familiar with the consideration of factors e.g. appropriateness of secondary storage for given applications, network speed etc The year 12 programme of study then builds on this by introducing consideration frameworks in both units and showing how those frameworks can be applied to different given scenarios.					
Cultural Capital	There is cultural capital in abundance in this programme of study: Given the relative youth of Computer Science as a discipline, cultural capital is usually a mix of computing history alongside identification and explanation of related personal experience to a given topic. For example, a networking topic might look historically at the influence of the cold war when designing the built-in resilience and redundancy of the internet, but equally relevant would be the day-to-day experience of using the internet that verifies the topologies and architectures learned in class.					
Mastery	In terms of mastery: Students are able to synthesize knowledge and understanding of computing to deconstruct problems, drawing on various sources of information to develop effective solutions with justification.					
Development of Character	A wide range of virtues are covered through the teaching of Computing: For example, through programming students learn creativity, open mindedness to alternative solutions, persistence through debugging, bravery in seeing mistakes positively and the appreciation of beauty in the simplicity of a solution.					
Extra-Curricular opportunities	In School: Coding Ambassador Outside of School: University computer science taster day					
Metacognitive Learning	Students in Computing will learn through expert modelling and exposure to a range of exam type questions and related mark-schemes, allowing them to tackle any type of question in this area. To form these routines in knowledge, feedback will form an important part of developing students as metacognitive learners, they will be able to effectively apply exam technique, and use feedback for areas of development, to help plan for success in future assessments/work. Students in Year 12 should be self-regulated learners, know how to learn, successfully revise, and apply knowledge of computing to make clear judgements and reach justifiable conclusions.					

