Our Lady and St. Bede Catholic Academy

Subject Curriculum – GCSE Computer Science Y10

	Autumn Term	Spring Term	Summer Term
Big Ideas & Purpose	**HT1** This unit of work is the foundation of the course and looks at the architecture of the modern computer. Pupils will: • Understand what the CPU of a computer does. • Know what the registers in a CPU are. • Know the stages of the fetch, execute cycle. • Know about other components of the CPU. • Know the components of the von Neumann architecture. • Understand what is meant by the term embedded system and give examples of embedded systems. **HT1/HT2** Developing on the skills from HT1 pupils will study different aspects of memory and storage. Pupil will learn: • The purpose and differences in primary memory. • The purpose and difference in secondary storage. • The characteristics of secondary storage. • The representation of binary units in computer science. • Binary & hexadecimal number systems. • The representation of characters, images and sound using binary. • The purpose and methods of compression.	**HT3** Building on skills from HT1 and HT2, pupils will study different aspects of networking. Pupils will learn about: • What LAN's/WAN's are • Star and Mesh topologies • Factors affecting the performance of a network. • About Client/server and peer to peer networks • The Cloud • Network hardware • Hosting, internet, DNS • WIFI/Bluetooth • Encryption • IP/MAC addresses • Protocols and Layers **HT4** This half term pupils will look at systems security. Systems security is subdivided into two sections. • Threats to computer systems and networks • Identifying and preventing vulnerabilities It builds upon pupils prior learning covered in the networks unit and links back to learning in KS3 covered in the Crime and Security unit of work.	**HT5** This half term students will look at systems software: Pupils will: • Understand the purpose and functionality of operating systems. • Understand the purpose and functionality of utility software. • Understand what utility system software is. **HT6** This half term students will look at 1.6 ethics. The ethical unit is subdivided into four topics. It builds on students' knowledge of all aspects of computing looking at the following areas: • Ethical • Legal • Cultural • Environmental The unit encourages students to apply their knowledge of the world thinking of the possible implications of using technology. The unit develops students' ability to think through different situations, scenarios considering the implications. Students will develop their extended writing skills to answer questions around these topics.

Programme of Study	HT1 J277 GCSE Computer Science	HT2 J277 GCSE Computer Science	HT3 J277 GCSE Computer Science	HT4 J277 GCSE Computer Science	HT5 J277 GCSE Computer Science	HT6 J277 GCSE Computer Science
Key Assessments	• HT1 1.1 Systems Architecture J277 (20 marks) • HT1/2 1.2 Memory and Storage (4 Tests 20 marks each assessment)		• HT3 1.3 Computer networks, connections and protocols (20 marks) • HT4 1.4 Network security (20 marks)		• HT1 1.5 Systems software (20 marks) • HT6 1.6 Ethical, legal, cultural and environmental (20 marks) • HT6 J277/01 Computer systems (mock exam) • HT6 J277/02 Computational thinking, algorithms and programming (mock exam)	
Key skills	• Maths • Programming • Theory • Problem solving • Logic • Memory • Exam technique	• Maths • Programming • Theory • Problem solving • Logic • Memory Exam technique	• Maths • Programming • Theory • Problem solving • Logic • Memory • Exam technique	• Maths • Programming • Theory • Problem solving • Logic • Memory • Exam technique	• Maths • Programming • Theory • Problem solving • Logic • Memory Exam technique	• Maths • Programming • Theory • Problem solving • Logic • Memory Exam technique
Links to careers	• Programmer • Computer games developer • Computer games tester • Software developer • App developer • IT trainer • Solutions architect • Test lead • Technical author • Technical architect	• Programmer • Computer games developer • Computer games tester • Software developer • App developer • IT trainer • Solutions architect • Test lead • Technical author • Technical architect	• Programmer • Computer games developer • Computer games tester • Software developer • App developer • IT trainer • Solutions architect • Test lead • Technical author • Technical architect • Network manager • Network engineer	• Programmer • Computer games developer • Computer games tester • Software developer • App developer • IT trainer • Solutions architect • Test lead • Technical author • Technical architect • Network manager • Network engineer	• Programmer • Computer games developer • Computer games tester • Software developer • App developer • IT trainer • Solutions architect • Test lead • Technical author • Technical architect • Network manager • Network engineer	• Programmer • Computer games developer • Computer games tester • Software developer • App developer • IT trainer • Solutions architect • Test lead • Technical author • Technical architect

Our Lady and St. Bede Catholic Academy

Subject Curriculum – GCSE Computer Science Y11

	Autumn Term	Spring Term	Summer Term
Big Ideas & Purpose	**HT1** Pupils have already learnt some of the basics of programming but within this unit will explore them in further depth. Pupils will learn the following: • The 3 basic programming constructs. • The different variable data types and the need for casting. • The arithmetic and Boolean operators. • Understand how to use basic file handling operations. • Understand the SQL commands: • Understand list/array's • Understand procedures and functions. • Understand how to use import random. **HT2** Pupils will develop their skills further by understanding how to produce robust programs. Pupils will learn: • Know what is meant by the term "defensive design considerations" when writing programs. • Understand why input validation is necessary and a range of validation techniques. • Understand what programmers can do to make their code more readable. • Understand how to refine algorithms to make them more robust. • Know what iterative/final testing is. • Understand suitable test data for a program. • Understand how robust programs are made.	**HT3** Now that pupils have a good understanding of how programs created students will looking into algorithms. Pupils will learn: • What abstraction and decomposition are and how they are used within computing. • Understand several different sorting algorithms and searching algorithms. • Understand how to create an algorithm. • The different symbols used in a flowchart. • Understand what a syntax/logic error is. **HT4** Pupils will look further at computational logic and IDE's. Pupils will learn: • How to make simple logic diagrams from Boolean expressions using AND, OR, NOT. • Understand how to complete truth tables • Understand how to create, complete or edit logic diagrams and truth tables for given scenarios. • The characteristics of high level and low-level programming languages. • Understand the terms: source code, assembly code and machine code • What a translator does. • Understand the differences between compilers and interpreters. • What an integrated development environment (IDE)	**HT5** Revision Real GCSE exams **HT6** Students have completed Computer Science

Programme of Study	HT1 J277 GCSE Computer Science	HT2 J277 GCSE Computer Science	HT3 J277 GCSE Computer Science	HT4 J277 GCSE Computer Science	HT5 J277 GCSE Computer Science	HT6 J277 GCSE Computer Science
Key Assessments	• 2.2 Programming Fundamentals (20 marks) • 2.3 Producing Robust Programs (20 marks) • HT2 J277/01 Computer systems (mock exam) • HT2 J277/02 Computational thinking, algorithms and programming (mock exam)		• HT3 2.1 Algorithms (20 marks) • HT4 2.4 Boolean Logic (20 marks) • HT4 2.5 IDE's (20 marks) • HT4 J277/01 Computer systems (pre-public exam) • HT4 J277/02 Computational thinking, algorithms and programming (pre-public exam)		• HT5 J277/01 Computer systems (real exam) • HT5 J277/02 Computational thinking, algorithms and programming (real exam)	
Key skills	• Maths • Programming • Theory • Problem solving • Logic • Memory • Exam technique	• Maths • Programming • Theory • Problem solving • Logic • Memory Exam technique	• Maths • Programming • Theory • Problem solving • Logic • Memory • Exam technique	• Maths • Programming • Theory • Problem solving • Logic • Memory • Exam technique	• Maths • Programming • Theory • Problem solving • Logic • Memory Exam technique	
Links to careers	• Programmer • Computer games developer • Computer games tester • Software developer • App developer • IT trainer • Solutions architect • Test lead • Technical author • Technical architect • Network manager • Network engineer • Forensic computer analyst • Cyber intelligence officer	• Programmer • Computer games developer • Computer games tester • Software developer • App developer • IT trainer • Solutions architect • Test lead • Technical author • Technical architect • Network manager • Network engineer	• Database administrator • Programmer • Computer games developer • Computer games tester • Software developer • App developer • IT trainer • Solutions architect • Test lead • Technical author • Technical architect • Network manager • Network engineer	• Programmer • Computer games developer • Computer games tester • Software developer • App developer • IT trainer • Solutions architect • Test lead • Technical author • Technical architect • Network manager • Network engineer	• Programmer • Computer games developer • Computer games tester • Software developer • App developer • IT trainer • Solutions architect • Test lead • Technical author • Technical architect • Network manager • Network engineer • Forensic computer analyst • Cyber intelligence officer	