

Year 12 Computer Science

Year Calendar Plan

Dates	Lesson Focus	Assessment/Revision
	<p>Red text identifies additions to the calendar plan since September 2019 Green text identifies topics that have been moved January 2020. Programming skills and some theory content is taught by WRL Some theory content is taught by BFN. Topics are revisited as needed throughout the year, for example by refreshing basics of operating systems from year 12 in term 2 of year 13 before moving on to more complex functions. Where topics are not specifically revisited in this plan, they should fall into spaced repetition or can be requested by students.</p>	
Term 1	<p>Introduction to the course Introduction to Object Oriented Programming using Java in the BlueJ environment 1.4.1 Data types – primitive data types, integer, real/float point, character, string and Boolean – presenting positive integers in binary – negative binary – addition and subtraction of binary integers. Represent positive integers in hexadecimal. Convert positive integers between binary hexadecimal and denary. 1.1.1 Structure and function of the processor – the ALU, control unit and registers – Buses, data, address, control and how this relates to assembly language programs – the fetch-decode-execute cycle including its effect on registers – Von Neumann, Harvard and contemporary processor architecture PC1 1.1.3 Input, Output and Storage – how different input, output and storage devices can be applied to the solution of different problems – use of magnetic, flash and optical storage devices. AW 1</p>	<p>Binary worksheets Revision PC1 Weekly spaced repetition test, quiz or recall session</p>
Term 2	<p>Object Oriented Programming using Java in the BlueJ environment 1.2.1 Operating Systems – need for function and purpose of operating systems – distributed, embedded, multi-tasking, multi-user and real time operating systems. 1.2.2 Applications Generation – nature of applications, justifying suitable applications for a specific purpose – utilities – open source vs. closed source 1.5 Legal, Moral, Ethical and Cultural issues – Data Protection Act, Computer Misuse Act 1990, Copyright Designs and Patents Act 1988, Regulation of Investigatory Powers Act 2000, Risks 2.1 Elements of Computational Thinking – thinking abstractly, thinking ahead 2.1 Elements of Computational Thinking – thinking procedurally, thinking logically 1.4.1 Representation and normalisation of floating point numbers in binary. Floating point arithmetic, positive and negative numbers, addition and subtraction. Bitwise manipulation and masks: shifts, combining with AND, OR, and XOR. How character sets (ASCII and UNICODE) are used to represent text Levels of Response Questions – how to answer these Revision of topics so far</p>	<p>Revision, worksheet, research Levels of response questions Ongoing revision PC2 Weekly spaced repetition test, quiz or recall session</p>
Term 3	<p>Object Oriented Programming using Java in the BlueJ environment Levels of response questions 1.3.2 Databases Relational database, flat file, primary key, foreign key, secondary key, entity relationship modelling. Methods of capturing data. 1.3.2 Databases Normalisation to 3NF Referential integrity SQL 1.4.3 Boolean Algebra Manipulate Boolean expressions, including the use of Karnaugh maps to simplify Boolean expressions. Use logic gate diagrams and truth tables. 1.4.3 Boolean Algebra Recap on simplifying algebra using different laws. Recap on Karnaugh maps. 1.3.3 Networks Characteristics and importance of protocols and standards Internet Structure 1.3.3 Networks Internet structure. Network security and threats, use of firewalls, proxies and encryption. Network hardware 1.3.3 Networks Client-server and peer to peer</p>	<p>Weekly spaced repetition test, quiz or recall session</p>
Term 4	<p>Object Oriented Programming using Java in the BlueJ environment 2.1 Elements of Computational Thinking Recap of computation thinking methods. Pseudocode 2.3.1 Algorithms Analysis and design of algorithms for a given situation. Algorithms for the main data structures, (stacks, queues, trees, linked lists, depth-first (post order) and breadth-first traversal of trees). Comparison of the complexity of algorithms.</p>	<p>PC4 Weekly spaced repetition test, quiz or recall session</p>
Term 5	<p>Introduction to programming project Analysis section of programming project Design section of programming project 1.3.1 Compression, Encryption and hashing Revision in preparation for PC6</p>	<p>PC5 Weekly spaced repetition test, quiz or recall session</p>
Term 6	<p>1.4.1 Representation and normalisation of floating point numbers in binary. Floating point arithmetic, positive and negative numbers, addition and subtraction. Bitwise manipulation and masks: shifts, combining with AND, OR, and XOR. How character sets (ASCII and UNICODE) are used to represent text 2.3.1 Algorithms Standard algorithms (bubble sort, insertion sort, merge sort and quick sorts). Design section of programming project</p>	<p>Weekly spaced repetition test, quiz or recall session</p>