ORMISTON RIVERS ACADEMY - CURRICULUM MAP

Computer Science	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
KEY TOPIC						
YEAR 7	**Using computers safely, effectively and responsibly: Moviemaker** File Management, Using Email, Cyberbullying, Social Networking – Audience, Assets and Evaluation. CMA	**Computational Thinking:** Decomposition, Pattern Recognition, Abstraction, Algorithms and Flow Charts Bebras Challenge	**Computer Fundamentals:** Elements of a Computer, how a CPU works, Binary and Data representation (characters),	**Spreadsheets:** Students will learn skills so that they can explain how spreadsheets are used for modelling scenarios in the real world. They will use set up a spreadsheet, enter and analyse data, use simple formulae and functions.	**Graphics:** Students will create graphics using Vectors- Draw basic shapes Manipulate individual objects and groups of objects	**Visual programming:** Kodu- students will learn basic programming skills using online block programming as an introduction to sequencing, selection and iteration program controls
YEAR 8	**Web Design:** Students will use Google Sites to produce a fit for purpose website. They will consider the audience accessibility, consistency and colour psychology.	**Algorithms** Recap on Computational thinking to prepare for the introduction for how algorithms are used by Processors to search and sort data. Bebras Challenge	**Cyber Security**: techniques used to steal data, disrupt systems, and infiltrate networks. looking at social engineering techniques used by cybercriminals. The unit will look at the more common cybercrimes such as hacking, DDoS attacks, and malware, and prevention CMA/DPA	**Computer Architecture:** Introduction to the concept of registers and how data travels within a CPU Difference between RAM and ROM Memory and Secondary Storage	**Data Representation:** How data is stored in binary focussing on images and sound Working out file sizes Data Compression	**Textual Programming:** Introduction into textual programming by way of Python Introducing variables and how they work. Writing a basic program. Debugging programs to ensure fit for purpose. Data types
YEAR 9	**HTML:** Write HTML code, create a multi-page website using Dreamweaver/ Google Sites. • Refining the website: the Equality Act 2010.	**Networks:** Studying network types, the internet, the World Wide Web. Comparing wireless and wired connections. Encryption Bebras Challenge	**Photoshop Skills** From a brief students will produce a media product that meets clients needs- this will include planning tools- gantt chart, pre- production diagrams, Photo editing skills	**Python Revisited:** Introducing the skill to use a loop to repeat a section of code. Write programs that use lists and counters correctly in conjunction with **for** loops. Acquiring skills to create and call a function or procedure	**Boolean Logic:** Recap of why data needs to binary Acquiring the skill to draw diagrams for the AND, OR and NOT gates. Introducing Truth Tables for AND, OR and NOT gates.	**Databases** How and why, they are used by organisations. Create a database table and adding features to an input form to make it more user-friendly
YEAR 10 GCSE Computer Science	**Boolean Logic:** Students will revisit Logic Gates AND OR and NOT- they will Drawing Logic Circuits and Truth Tables for 3rd Level Logic Circuits. Using Logic gates to determine outcome of a written program and also Data units – including binary/hexadecimal conversions	**Data Representation/ Algorithms:** Recap how data is stored in binary, character sets, images and sound and calculate file sizes. Including compression Computational thinking	**CPU Architecture:** Recap on registers and learning about what they do, data flow inside the processor, Use of assembly code. Buses and types of architecture **Programming**- sub programs	**Networks:** WANs LANs- PEER2PEER, client server models- network hardware Network topologies, IP and MAC addressing DNS- the internet	**Memory/ Storage:** Characteristics of memory and storage- best use in certain scenarios. Primary and secondary memory Optical, Magnetic and Solid state. RAM and ROM, virtual memory Suitability of storage devices **Programming :**2D arrays, read/write to files	**Wired and Wireless Networks:** Understanding the different connections and best use. Includes Layers and protocols with students learning how and when certain protocols are used within a network. IP and MAC addressing- why needed **Practice programming** and revision for end of year assessment

Programming Skills: Structure, Variables, Program controls, debugging, decomposition, data types

YEAR 11 GCSE Computer Science	**Threats to computer systems and networks including prevention:** Learning about different forms of attack such as malware, DOS and data interception. Students will then look at common prevention methods such as firewalls and physical security. Also Covering defensive design to anticipate misuse	**Operating systems, Legal Ethical Issues and Utility Software** Looking at the user interface, memory, user and file management. Learning about Encryption, defragmentation and compression software as utilities. Computer Laws covered, as well as environmental, cultural, ethical issues Inclusivity and accessibility Computational thinking	**Search and Sort Algorithms:** Recap on previous learning, with added insertion sort and use of practical programming to deepen understanding **IDE:** Tools found in an IDE to aid code development **Languages:** High and low level, uses of translators	**Practical Skills Revision/ Theory Revision:**	**Practical Skills Revision/ Theory Revision:**	

Programming Skills: Additional programming techniques such as string manipulation, read and write to files, 1 and 2D arrays, SQL, Random number generation and sub functions. Testing

Exam Components – Unit 1 and Unit 2- run concurrently

| YEAR 12 Ctec Level 3 IT Introductory Diploma -Application Developer Route | **Unit 1: Fundamentals of IT** | **L01- Computer Hardware,** Computer components, Connectivity methods, Types of computer systems | **L02- Understand Computer Software** Covering types, applications and utility software Including operating systems, communication methods, software trouble shooting and protocols. | **L03- Understand business IT systems** Server Types, virtualisation, network characteristics, connection methods and business systems | **L04- Understand employability and communication skills used within an IT environment** Communication skills and technology, personal attributes, ready for work, job roles and bodies and certification. **LO5- Understand ethical and operational issues and threats to computer systems** Ethical and operational issues Threats, physical and digital security including data and system disposal | **Exam Revision** **Exam** | **Coursework- This is a project that covers Unit 6,8 and 21** **Unit 6/8- LO1** Application development models divide the process of development into distinct phases- students will research different methodologies, evaluate them and compare them **Unit 21- L01** Looking at the content that goes toward creating a website and doing research on that and creating a report. Researching how websites are attacked and creating a report that stipulates the issues with ways that these can prevented. |
| | **Unit 2: Global Information** | **LO1- Where information is held globally** Holders of information Types of information Storage media Types of information access and storage devices The internet & WWW technologies | **LO2 -Understand the styles, classification and the management of global information** Learn about different information styles to understand how they are used for different purposes. How Classifications impact on holders of information and the need access to good quality information and the impacts when information quality is poor. Information management **LO3- Understand the use of global information and the benefits to individuals and organisations.** Learn the difference between data and information | **LO3 Ctd-** Categories of information used by individuals and organisations. Stages of data analysis and the tools used. Information System Structures including benefits and drawbacks- Big data **LO4- Understand the legal and regulatory framework governing the storage and use of global Information.** Learn actions required to comply with legislation and know the applicable laws. | **LO4 ctd-** Learn how legalisation is applied around the globe. IT and the environment will be covered **LO5- Understand the process flow of information.** Data types and sources, Interpret and complete Data Flow diagrams. Impacts to data flow **LO6 Understand the principles of information security** Learn the main Security Principles for data storage, the risks and impacts of security issues. How these can be prevented through physical and logical protection. | **Revision using a case scenario released by exam board** **Exam** | |

YEAR 13 Ctec Level 3 IT Introductory Diploma	**Unit 8/6/21 L02**	**Unit 8/6/21 L03**	**Unit 8/6/21 L03**	**Unit 8/6/21 L04**	Coursework Improvements	
	Students will create a questionnaire to ascertain client needs- to then produce a feasibility study, project plan and a business case for their projects	Students will begin to design their product, using planning tools such as sitemaps and wireframes- these will then produce a mock up which needs to be presented to the client for possible changes from feedback. A project plan needs to be formulated and then a phase review	Skill building on Dreamweaver and HTML- Students will be creating their products from their updated designs- following their planning documents intently. Interactivity will be documented and a phase review of the production stage carried out- Feedback from client on prototype evaluated	Team feedback is analysed for future projects, Including lessons learned- final adaptations are implemented, A project closure report is created. Discuss future security implications and potential issues regarding the project. Prototype is presented to client.		