

# The Nottingham Emmanuel School – Computer Science & IT Curriculum Map (2019-2020)



## Years 7 & 8 Curriculum

	AUT 1	AUT 2	SPR 1	SPR 2	SUM 1	SUM 2
Year 7	<b>7.1 – Essential IT Skills</b> Introduction to IT @ NES Key IT Software Skills File Management Skills	<b>7.2 – CS Fundamentals 1</b> <u>What is a computer system?</u> Input Devices Output Devices Storage Devices inc. the Cloud  <u>Data Representation</u> Binary & Denary Numbers Converting to/from Binary Binary Addition	<b>7.3 – Algorithms 1</b> Importance of Instructions Sequence Selection Iteration Flowcharts Written Algorithms	<b>7.4 – Graphics 1</b> Types of Images – Bitmap vs. Vector Image File Types Pixels and Resolution Quality of an Image Photoshop Skills		<b>7.5 – Computational Thinking</b> Problem Solving Tasks Decomposition Abstraction Pattern Recognition Algorithms
	<b>8.1 – CS Fundamentals 2</b> Class specific focus on key areas introduced in Year 7.	<b>8.2 – Programming in Python</b> Introduction to Python Basic Input/Output Data Types Sequence & Selection	<b>8.3 – Graphics 2</b> Types of Images Image File Types Pixels and Resolution Quality of an Image Advanced Photoshop Skills		<b>8.4 – Multimedia Products</b> Client Briefs Target Audience Mood boards Collecting, creating and editing Assets Creating an Interactive Multimedia Presentation	<b>8.5 – Digital Sounds</b> Properties of a Digital Sound Sound File Types Audacity Skills – creating a sound sequence

## Computer Science Pathway

	AUT 1	AUT 2	SPR 1	SPR 2	SUM 1	SUM 2
Year 9	<b>Data Storage</b> Units of Storage Binary / Denary / Hexadecimal Number Systems Binary Addition & Shifts Character Sets Storage of Images and Sound Compression – Lossy & Lossless		<b>Primary Storage (Memory)</b> ROM, RAM and Virtual Memory  <b>Secondary Storage</b> Optical, Magnetic & Solid State Characteristics – capacity, speed, portability, durability, reliability and cost.	<b>Networks 1</b> Types of Network: LAN & WAN Performance of Networks Client-Server vs. Peer-to-Peer Network Hardware Star & Mesh Topologies Wired vs. Wireless Connections	<b>Network Security</b> Forms of Attack (e.g. malware, brute-force, DoS etc.)  Common Prevention Methods (e.g. firewalls, passwords, encryption, penetration testing, anti-malware software etc.)	<b>Ethical, Legal Cultural and Environmental Impact</b> Impact of digital technology on wider society.  Knowledge of legislation relevant to Computer Science.
	<b>Programming Fundamentals</b> Use of the Python programming language – developing skills as the year progresses. Knowledge and use of variables, constants, operators, inputs, outputs and assignments, programming constructs, data types.					

Year 10	<b>System Architecture</b> Purpose of the CPU Von Neumann – Registers CPU Components Factors affecting performance Embedded Systems	<b>Networks 2</b> Star & Mesh Topologies Wi-Fi & Ethernet IP & MAC Addressing Protocols & Layers Packet Switching	<b>Systems Software</b> Operating Systems Utility Software  <b>Translators &amp; Languages</b> High & Low Level Languages Compilers, Interpreters & Assemblers IDE's	<b>Computational Logic</b> Data in binary form Logic Gates Truth Tables Boolean Operators Logical Operators Arithmetic Operators	<b>Unit 3 Programming Project</b>  Required practical programming project undertaken across 20 classroom hours.  Set by the exam board and assesses programming techniques as well as the systems life cycle of analysis, design, development, testing and evaluation.
	<b>Programming Techniques</b> Use of the Python programming language – developing skills as the year progresses. Knowledge and use of variables, constants, operators, inputs, outputs and assignments, programming constructs, data types. Advanced Skills:				
Year 11	<b>Robust Programming</b> Defensive design considerations Maintainability of code Purpose & Types of Testing Test Data Syntax & Logic Errors	<b>Algorithms</b> Computational Thinking Search Algorithms Sort Algorithms Pseudocode Flow Diagrams	<b>Exam Preparation</b> Bespoke revision activities identified for the class Exam question techniques and practice.		
Year 12	<b>SLR 1, 2, 3 &amp; 12</b> Structure & Function of the CPU Types of Processor Input, Output & Storage Web Technologies	<b>SLR 13 &amp; 18, 19, 20 &amp; 21</b> Data Types Thinking Abstractly Thinking Ahead Thinking Procedurally Thinking Logically	<b>SLR 4, 5 &amp; 6</b> Operating Systems Applications Generation Software Development	<b>SLR 10, 11, 14, 15 &amp; 25</b> Databases Networks Data Structures Boolean Algebra & Logic Algorithms for AS Level	<b>SLR 16 &amp; 17</b> Computing related Legislation Legal, Moral, Ethical & Cultural Issues of Digital Technology
	<b>Programming SLR's: 8 &amp; 23</b> Introduction to Visual Basic Procedural Programming Languages (Program Flow, Constructs, Variables, Constants, Procedures, Functions, Arithmetic/Boolean/Assignment Operators, String/File Handling, IDE's) Assembly Language (Little Man Computer)				

## IT / Creative iMedia Pathway

	AUT 1	AUT 2	SPR 1	SPR 2	SUM 1	SUM 2
Year 9 iMedia	<b>Multimedia Presentations</b> Multimedia Assets & File Types – Images, Video etc. Skills in creating interactive multimedia presentation. Following a design brief for a given target audience.		<b>Digital Sound</b> Sound Assets & File Types Audacity skills to create and re-purpose sound sequences.	<b>Digital Graphics</b> Use and purpose of graphics Photoshop skills to create and re-purpose graphics.	<b>R082 Exam Board Set Assignment – Digital Graphics</b>  Understand the purpose and properties of digital graphics. Plan and create a digital graphics. Review the digital graphic created.	
	<b>Pre-Production Documents</b> Purpose, use and content of: Mood boards, mind maps, visualisation diagrams, storyboards and scripts. Knowledge of camera movements, shot types etc.					

<b>Year 10 iMedia</b>	<p><b>R082 Exam Board Set Assignment – Digital Graphics</b> Understand the purpose and properties of digital graphics.</p> <p>Plan and create a digital graphics.</p> <p>Review the digital graphic created.</p>	<p><b>R081 Pre-Production Skills</b> LO1 - Purpose, use and content of: Mood boards, mind maps, visualisation diagrams, storyboards and scripts. LO2 - Client requirements, work plan, research, target audience, hardware, software, health and safety and legal considerations. LO3 – Create pre-production documents and knowledge of file formats and naming conventions. LO4 – Review pre-production documents.</p>	<p><b>R081 Exam Preparation</b> Bespoke revision activities identified for the class. Exam question techniques and practice.</p>	<p><b>Digital Animation</b> Purpose and use of animations. Animation techniques. Fireworks Software Skills</p>
<b>Year 11 iMedia</b>	<p><b>R087 Exam Board Set Assignment – Multimedia Products</b> Understand the purpose and properties of interactive multimedia products. Plan and create an interactive multimedia presentation. Review the interactive multimedia presentation created.</p>	<p><b>R088 Exam Board Set Assignment – Digital Sound Sequence</b> Understand the purpose and properties of digital sound. Plan and create a digital sound sequence. Review the digital sound sequence created.</p> <p><b>Any re-submissions for the previous R087 coursework unit.</b></p>		
<b>Year 12 - Level 2 IT</b>	<p><b>Unit 1 – Essentials of IT</b> Hardware Components – Computer Systems, Networks, Connectivity, Protocols, Fault Diagnosis Software Components – Systems Software, Application Software, Utility Software, Security Installation &amp; Upgrade – Procedures, Health &amp; Safety, Organisational Responsibilities World Wide Web – Use of the Internet, the Cloud, Social Media, Emerging Technologies Benefits if using IT in Business – Operational Activity, Working with Others, Support Business Activities</p> <p><b>Unit 2 – Essentials of Cyber Security</b> Cyber Security – Definition, Purpose, Importance, Type of Attack/Attacker, Legal Implications Threats &amp; Vulnerabilities – Types of treat and how they can occur, Impacts of an attack Minimise Impacts – Logical &amp; Physical Protection Measures, Organisational Policies</p>	<p><b>Unit 8 – Using Emerging Technologies</b> Knowledge and skills in order to undertake the exam board set assignment to:</p> <p>Understand technologies that are currently emerging. Be able to explore how emerging technologies can support business needs. Be able to reflect on future impacts of emerging technologies.</p>		
<b>Year 12 - Level 2 IT</b>	<p><b>Unit 17 – Using Data Analysis Software</b> Data analysis and Microsoft Excel skills in order to undertake the exam board set assignment to: Understand the data used by business. Be able to select and use software to analyse data for business purposes. Be able to present the results of data analysis to the client.</p>			
<b>Year 13 - Level 3 IT</b>	<p><b>Unit 5 – Virtual and Augmented Reality</b> Understand virtual and augmented reality and how they may be used. Be able to design virtual and augmented reality resources. Be able to create a virtual or augmented reality resource. Be able to predict future applications for virtual and augmented reality.</p> <p><b>Unit 9 – Product Development</b> Understand the product development life cycle. Be able to design products that meet identified client requirements. Be able to implement and test products. Be able to carry out acceptance testing with clients.</p>	<p><b>Unit 13 – Social Media and Digital Marketing</b> Understand digital marketing. Understand the use of social media in a business. Be able to plan content and propose appropriate social media channels for a digital marketing campaign. Be able to develop a social media digital marketing campaign.</p>		