

Curriculum Overview

Information Technology /2020-2021

St Michael's
Catholic High School



"Bringing Christ to all and all to Christ"

CURRICULUM INTENT:

The Computing & IT Department wants to inspire the next generation of computer scientists, whilst at the same time equipping all students with the digital literacy skills to enable them to make appropriate choices when they are using computer equipment and interacting with the wider world. E-safety is therefore a theme which is visited every year. We aim to provide a broad, balanced and enjoyable computing education for all of our students. Some of the content students will cover includes the fundamentals of computer equipment (hardware and software), algorithmic thinking, creating computer programs using visual and text-based programs, as well as data handling techniques.

CURRICULUM IMPLEMENTATION: IT

	AUTUMN TERM		SPRING TERM		SUMMER TERM		
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	
Year 7 Knowledge: What will students know?	Students will know how to access their own user area on the school network, as well as how to access subject areas on the RMShared area. Students will know how to log on, change passwords, and save work to their user area. They will know how to use Gmail email and access material on Google classroom. Students will know the definition of 'fake news' and the criteria that can be used to tell if information is accurate, reliable and trustworthy.	Students will know that all online activity leaves a digital footprint. Students will know the risks of online activity and learn how they can stay safe. Students will know how to be responsible digital citizens. To know that their current actions might have an impact on their future selves.	Students will know what algorithms are, how they can be written and how can be used in computing	Students will know more about the units of measurements used in computing, e.g. bit, nibble, bytes, Kilobyte. Students will know the difference between binary (base 2) and denary (base 10)	Students will know what makes an effective game for one and two players	Students will know that the rate of change in technology is fast-paced. They will research new developments (future technology) and share these ideas with classmates	Year 7
Year 7 Skills: What skills will students have developed?	How to change their password How to send/receive and delete emails How to access Google classroom from inside and outside school, and how to upload work	To think before sharing and or posting To be able to judge the possible impact of their online activity on others	Students will be able to write and draw simple algorithms and use SNAP BYOB software to create programs to draw shapes (automatically)	Students will be able to list units of measurements in order Students will be able to convert binary to denary and denary to binary	Students will further develop algorithms to plan and create a challenging one- or two-player game using Kodu Gamelab software	Students will be able to work in groups and share workload They will be able to present future technology ideas using reliable sources of information	Year 7

Year 8 Knowledge: What will students know?	Students will investigate 'How Computers Work', looking at the hardware and software that comprise computers.	Students will revisit the etiquette of social networking	Students will know that webpages are coded using HTML and CSS	Students will know that webpages are coded using HTML and CSS	Students will further develop algorithmic thinking by revisiting SNAP BYOB where they will program code to encrypt and decrypt text based on user inputs	Students will learn how to use spreadsheets effectively for storing, manipulating and presenting data	Year 8
Year 8 Skills: What skills will students have developed?	Students will be able to identify common hardware components and uses of common software	Students will be able to recognise cyber-bullying and what to do about it	Students will be able to adapt and write HTML code to create webpages of their own	Students will be able to adapt and write HTML code to create webpages of their own	Problem solving skills Students will use the concept of the Caesar cipher to write their code	Students will be able to format data in a worksheet, use formulae and create charts/graphs	Year 8
Year 9 Knowledge: What will students know?	Students will know that databases can also be used for data handling	Students will learn about different types of computer networks and viruses. Students will know the difference between LANs and WANs. Students will know how computer viruses can be spread	Students will know what sexting is and why it is a high-risk activity for young people Students will know who to talk to if they are worried about it	Students will develop text-based coding skills by using 'Python' to program solutions to challenges	Students will use 'App Inventor' software to create their own app	Students will register or the 'Duke of York Digital Award' which allows them to choose the IT-or Computing or Enterprise related topics linked to their GCSE options	Year 9
Year 9 Skills: What skills will students have developed?	Students will be able to add, edit and delete data in a database, as well as run queries and create database reports	Students will be able to draw and identify star, ring and bus networks as well as identify different types of viruses and how they can protect themselves from viruses	Students will be able to judge whether their actions are sexting or not	Students will learn about the techniques of sequence, selection and iteration	Students will learn problem solving skills and work with others to create their own app	Students will be responsible for choosing their own 'badges' to complete and managing their own time	Year 9
Key Stage 4 GCSE Examination Board: OCR Cambridge Nationals in IT (L1/2) Exam taken in Year 10 (RO12); NEA course work completed in Year 11 (RO13)							
Year 10 Knowledge: What will students know?	Understand the tools and techniques that can be used to initiate and plan solutions. Know which phases interact and which	Understand how data and information can be collected, stored and used, and the benefits/drawbacks of different methods	Understand the factors to be considered when collecting, processing and storing data/information	Understand the different methods of processing data and presenting information	Exam preparation:	How to create, edit, delete and process data using appropriate software tools/techniques	Year 10

	don't and what iteration is						
Year 10 Skills: What skills will students have developed?	<p>Draw, label and explain the 4 stages of cycle</p> <p>Describe inputs/ outputs for each phase</p> <p>Explain user requirements, user constraints and legal implications</p> <p>Create a project plan, test plan, constraints list and success criteria for a project</p> <p>Use SMART goals</p> <p>Use Gantt charts, PERT, critical path analysis, flow charts, visualisation diagrams, mind maps and lists</p>	<p>Identify appropriate datatypes</p> <p>Explain the difference data and information</p> <p>Describe methods of data collection such as questionnaires, sensors and interviews; explain benefits/drawbacks</p> <p>Research technology such as QR codes, wearable technology etc.</p> <p>Describe different methods of storing data (physical and cloud) and their key features</p> <p>Discuss the real-life applications of data</p>	<p>Describe types of threats</p> <p>Discuss vulnerabilities that can be exploited in a cyber-security attack, and the impacts/ consequences of</p> <p>Explain prevention Measures</p> <p>Describe current relevant IT legislation, its implication and applications</p> <p>Know the difference between reliability, bias, validity when collecting and using data/information</p>	<p>Know when to use a spreadsheet or a database to process data (in a given context)</p> <p>Be able to compare the advantages and disadvantages of spreadsheets and databases for processing data</p> <p>Compare word processor, DTP, presentation, spreadsheet and database software for presenting information</p> <p>Identify hardware, software and connectivity requirements/ resources needed when presenting information</p>	<p>Exam techniques, e.g.</p> <p>Reading question carefully</p> <p>Managing time</p> <p>Using key words</p>	<p><u>SPREADSHEET</u></p> <p>Use cell referencing; use functions; use logical (Boolean operators); make decisions (if statements); identify /correct errors; join, split and present text; link worksheets; link to and import external data; present data in different ways (e.g. chart, pivot table); use macros; apply security settings; export data</p> <p><u>DATABASE</u></p> <p>Create relationships; use data validation; create and use input forms; run queries; apply database security; import/export data</p>	Year 10
Year 11 Knowledge: What will students know?	To be able to select and present information in the development of the solution to meet an identified need	To be able to initiate and plan a solution to meet an identified need To be able to iteratively review and evaluate the development of the solution	Familiarise students with expectations of RO13 NEA. e.g. what the brief will look like, how to manage time and tasks, how to store data securely	NEA coursework (RO13) requirements, deadlines and resources	NEA coursework (RO13) requirements, deadlines and resources	n/a	Year 11
Year 11 Skills: What skills will students have developed?	<u>Use word processing and DTP software:</u> Convert table to text and text to table; use referencing tools such	Perform a key-word analysis Perform a SWOT analysis Set SMART objectives	Understanding the tasks; Choosing suitable software to complete tasks;	Apply all skills from Y10 and Y11 to produce a working IT solution to a problem provided by the	Apply all skills from Y10 and Y11 to produce a working IT solution to a problem provided by the	n/a	Year 11

	<p>as footnotes, endnotes and captions; use tables; use indexes; mail merge; use macros to automate tasks; link and embed data; use watermarks; use sections, headers and footers; review documents using comments/tracking; apply passwords; save and export changes to documents</p> <p><u>Use presentation techniques:</u> Use text and objects to link to documents /webpages; insert and modify images; manage the slide show: sound/video /automation; add speaker notes; customise slide shows: master slides; templates; integrate with other applications; apply security, e.g. permissions; save and export slideshow presentations</p> <p><u>Present information on websites:</u> Use HTML and CSS; create webpages for mobile devices; consider usability and accessibility; use blogs and social media</p>	<p>Set a schedule with tasks/activities, timescales, resources, milestones Make a contingency plan Use a range of software to plan (spreadsheet/ project management/ DTP/word processing) Create project documentation such as a data dictionary, visualisation diagram, design mock-up, wireframe (blueprint),prototype Undertake iterative testing, checking for functionality, usability, accessibility Create test plans Undertake iterative testing</p>	<p>Managing time and meeting deadlines; Taking responsibility and working independently; Planning tasks effectively; Using resources available</p>	<p>exam board. Students will have to manage their own time, keep back-ups of work, work independently to plan, create and test the system within the 20 hour time limit</p>	<p>exam board. Students will have to manage their own time, keep back-ups of work, work independently to plan, create and test the system within the 20 hour time limit</p>		
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<p>Year 12 Knowledge: What will students know?</p>	<p>Unit 1: Fundamentals of IT Understand computer hardware Understand computer software Understand business IT systems</p>	<p>Unit 1: Fundamentals of IT Understand employability and communication skills in an IT environment Understand ethical and operational issues and threats to a computer system Exam preparation</p>	<p>Unit 2: Global Information Understand where information is held globally and how it's transmitted Understand the use and benefits of global information Understand the legal framework governing global information Understand the principles of information security</p>	<p>Unit 2: Global Information Understand styles, classification and management of global information Understand the legal framework governing global information Understand the flow of information</p>	<p><i>Unit 2: Exam preparation</i> Unit 17: The Internet of Everything (IoE) Understand what is meant by the Internet of Everything (IoE)</p>	<p>Unit 17: The Internet of Everything (IoE) Understand what is meant by the Internet of Everything (IoE)</p>	<p style="text-align: center;">Year 12</p>
<p>Year 12 Skills: What skills will students have developed?</p>	<p>Describe the different types of computer hardware required for different computer systems, and their components Understand computer connectivity methods and hardware needed Understand network topologies and protocols Understand/describe different types of software and their characteristics Understand different operating systems Understand methods of troubleshooting Be able to convert between different numbering systems Describe different business management systems</p>	<p>Know about the different communication skills used in the IT environment and the potential barriers to communication Describe and use different communication's technologies Identify and describe (personal) attributes valued by employers in the IT sector Research different job roles Describe ethical and operational issues such as whistleblowing, health and safety etc.</p>	<p>Understand the access issues to information across the global divide Know about different types of information storage media and devices and their characteristics Know what the internet is and the characteristics of internet connections, as well as information formats used on the World Wide Web Understand the difference between data and information Be able to describe the different stages of data analysis, and the tools used Understand the risks of data security</p>	<p>Know about different information styles and their purposes Know how information can be classified Know about the different legislation and regulation that relates to the storage and use of information Understand what Green IT is and how businesses can be more 'green' Understand different data types and sources of information Be able to draw and interpret data flow diagrams</p>	<p>Understand the 4 pillars of the IoE Describe the applications of the IoE Assess the global impacts of the IoE (good and bad)</p>	<p>Devices used to gather data and how the data can be analysed and used Understand the concept of 'Big Data' Describe the technology that allows for connectivity Understand the security issues linked to the IoE</p>	<p style="text-align: center;">Year 12</p>

			breaches, and the measures that could be used to mitigate				
Year 13 Knowledge: What will students know?	Unit 3: Cyber Security Understand what is meant by cyber security Understand the issues surrounding cyber security	Unit 3: Cyber Security Understand how to protect against cyber security incidents Understand how to manage cyber security incidents Exam preparation	Unit 17: The Internet of Everything (IoE) Be able to repurpose technologies to extend the scope of the IoE Be able to present concept ideas for repurposed developments	Unit 9: Product Development Understand the product development life cycle Be able to design products that meet identified client requirements	Unit 9: Product Development Be able to implement and test products Be able to carry out acceptance testing with clients	n/a	Year 13
Year 13 Skills: What skills will students have developed?	Understand why information stored on digital systems/devices needs to be kept secure at all times Be able to explain the types and nature of cyber security incidents that affect individuals, states and organisations Be able to identify a wide range of threats to cyber security including those threats that are accidental or intentional Know about the types of attacker, their characteristics and their motivations	Know about the various measures that should be taken to manage cyber security Be able to discuss the benefits of testing and monitoring systems Describe different security controls in different situations Understand the procedures put on place to report an incident and why these are important Be able to describe the stages of investigation, and complete sections of a cyber security report	Be able to research existing IoE technologies Be able to re-design existing technologies with a new purpose Be able to judge the feasibility of ideas Be able to present ideas to an audience, take feedback and act on it	Be able to explain the different product development methodologies Describe the different phases in product development Identify possible constraints Be able to describe user requirements (functional and non-functional) Design solution(s) to a problem	Be able to take designs and create and test a product Be able to meet with client and show how product works, and produce user documentation, and explain maintainability of the product	n/a	Year 13

IMPACT:

includes assessment information, feedback information, how students learn, impact of the curriculum

In KS3 students will be assessed roughly once a half-term, which normally coincides with the end of a topic. Assessment may take the form of a paper-based test, an online test or the completion of a series of tasks that show the practical skills a student has developed. Students are encouraged to share ideas and test each other's programs/solutions e.g. creating a game.

All topics covered in KS3 are designed to prepare students for either GCSE Computer Science or the L1/2 OCR National in Information Technologies. The GCSE is assessed through two exams at the end of Year 11, whilst the L1/2 course is assessed through an external examination at the end of Year 10 and an NEA course work unit completed under controlled conditions in Year 11 (both elements are worth 50% each).

In KS4 students have formal end of unit assessments, with developmental quizzes and tests part way through the topics to facilitate formative feedback. All assessments aim to prepare students for their final external examinations and will get progressively more challenging throughout the key stage.

Both KS4 courses allow for progression onto the L3 Cambridge Technicals in IT course in the Sixth Form. This is equivalent to one A Level. The course has aspects of computer systems, product design, project life cycle and data handling, and is assessed via both external examinations and internal course work assessments. There are three external (mandatory examinations) and the two internal assessments are chosen from a list of four optional units.