

Computing Curriculum Overview

Computing (KS3/4) and Computer Science (KS4/5)

Computing is viewed at Tiffin as a means of expressing oneself - a Performing Art. It can help your message reach a wide audience, it can provide a structure to help you form your ideas and it can boost your creative process in terms of speed and quality.

The Information and Communication Technology (ICT) strand of Computing explores three interrelated skill areas: using ICT systems; finding and selecting information; and developing, presenting and communicating information. From KS3, Computing helps to develop essential concepts and skills relating to the ability to use computational thinking (problem decomposition, pattern recognition, abstraction and algorithms) and coding to analyse a problem and develop solutions. **The KS3 National Curriculum for Computing is completed during Years 7 & 8.**

Our programmes of study will enable our learners to develop:

- ☐ key skills that prove aptitude in digital information technology, such as project planning, designing and creating user interfaces and dashboards as a way to present and interpret data
- ☐ processes that underpins effective ways of working in digital information technology, such as project planning, the iterative design process, cyber security, virtual teams, legal and ethical codes of conduct
- ☐ attitudes that are considered most important in digital information technology, including personal management and communication
- ☐ knowledge that underpins effective use of skills, process and attitudes in the sector such as how different user interfaces meet user needs, how organisations collect and use data to make decisions, virtual workplaces, cyber security and legal and ethical issues.

The KS4 National Curriculum for Computing is delivered through independent learning and project-work, monitored and assessed by Computing teachers.

Students follow the OCR Computer Science (J277) GCSE Course from Year 9. All the way through the GCSE course, students learn to program in JavaScript, C#, Visual Basic and Python and engage in programming challenges that require them to write their own code which passes parameterised unit tests and other coding activities.

The A level course follows the OCR H446 Computer Science course. Students are encouraged to develop at least 3 programming languages.

KS3 Computing Curriculum

	Year 7	Year 8
Autumn Term 1	Digital Literacy Online Safety	Computer Systems Features of a tablet computer
Autumn Term 2	Block based programming Graphic Design BEBRAS UK Competition	User Interface design Web page design (HTML/CSS) BEBRAS UK Competition
Spring Term 1	Internet Technologies Presenting data using a word processor Manual and automatic data input and output	Data protection Introduction to App Design
Spring Term 2	Digital wellbeing Presenting numerical data BEBRAS Coding Challenge	BEBRAS Coding Challenge Complete App Design and evaluation
Summer Term 1	Introduction to Spreadsheets	Digitisation (Text, Image, Sound, Compression, encoding, decoding, encryption) Data storage and structures
Summer Term 2	Multimedia	Sorting and Searching Algorithms Introduction to JavaScript

KS4 Computing Curriculum

	Year 9	Year 10	Year 11
Autumn Term 1	Module KS4:1 - Online Safety 1 1. Fake news 2. Social Media 3. Navigating Ambiguity and Change 4. AI and Social Media 5. AI and data protection Digital Literacy - Word Processing (Creating a glossary of terms relating to online safety)	Module 7 - IoT Project ☐ Understand IoT Fundamentals ☐ Cultivating a digital mindset ☐ Explore Real-World Applications ☐ Analyse Benefits ☐ Examine Challenges and Risks ☐ Learn Best Practices ☐ Evaluate Workforce Impacts	Module 7 - IoT Project ☐ Understand IoT Fundamentals ☐ Explore Real-World Applications ☐ Analyse Benefits ☐ Examine Challenges and Risks ☐ Learn Best Practices ☐ Evaluate Workforce Impacts
Autumn Term 2	Module KS4:2 - Algorithmic Thinking 1 ☐ Decomposition ☐ Pattern Recognition ☐ Abstraction & Generalisation ☐ Algorithm Design: ☐ Logical Reasoning ☐ Debugging & Evaluation	Module KS4:2 - Algorithmic Thinking 1 ☐ Decomposition ☐ Pattern Recognition ☐ Abstraction & Generalisation ☐ Algorithm Design: ☐ Logical Reasoning ☐ Debugging & Evaluation	Module KS4:8 - Algorithmic Thinking 2 ☐ Decomposition ☐ Pattern Recognition ☐ Abstraction & Generalisation ☐ Algorithm Design: ☐ Logical Reasoning ☐ Debugging & Evaluation Module KS4:5 - Digital Ethics ☐ Data privacy and security ☐ The balance between privacy and security ☐ Ethical aspects of advancing tech ☐ Benefits of new technology ☐ Negative effects to watch of for ☐ Unintended consequences of tech

KS4 Computing Curriculum

	Year 9	Year 10	Year 11
Spring Term 1	Module KS4:3 - Working with data ☐ Big data and datasets ☐ Automatic Data Input & Data Capture Methods ☐ Insights from Data and AI ☐ Compute key metrics and trends. ☐ Use data to answer analytical and scenarios based questions. ☐ Create and interpret diverse data visualisations, including line charts, column charts, radar charts, and sparklines. ☐ Build integrated dashboards.	Module KS4:9 - Online Safety 2 ☐ Evaluate credibility using structured methods ☐ Explain how media ownership and algorithms influence content ☐ Understand how personal data is collected and monetised ☐ Apply GDPR knowledge to real-life scenarios ☐ Respond appropriately to online risks and breaches ☐ Critically analyse media messages with evidence	Module KS4:9 - Online Safety 2 ☐ Evaluate credibility using structured methods ☐ Explain how media ownership and algorithms influence content ☐ Understand how personal data is collected and monetised ☐ Apply GDPR knowledge to real-life scenarios ☐ Respond appropriately to online risks and breaches ☐ Critically analyse media messages with evidence
Spring Term 2	Module KS4:4 - Computational Methods 1 ☐ Programming & Data ☐ Data Structures ☐ Modular Programming ☐ Boolean Logic ☐ Binary Representation ☐ Binary Arithmetic	Module KS4:4 - Computational Methods 1 ☐ Programming & Data ☐ Data Structures ☐ Modular Programming ☐ Boolean Logic ☐ Binary Representation ☐ Binary Arithmetic	Module KS4:10 - Computational Methods 2 ☐ Programming & Data ☐ Data Structures ☐ Modular Programming ☐ Boolean Logic ☐ Binary Representation and Arithmetic Module KS4:6 - AI Policy ☐ Data privacy and security ☐ The balance between privacy and security ☐ Data ownership, bias and fairness ☐ Generative AI in Education ☐ Social and Environmental impact ☐ AI-Powered Threats and Defenses

KS4 Computing Curriculum

	Year 9	Year 10	Year 11
Summer Term 1	Module KS4:5 - Digital Ethics ☐ Data privacy and security ☐ The balance between privacy and security ☐ Ethical aspects of advancing tech ☐ Benefits of new technology ☐ Negative effects to watch of for ☐ Unintended consequences of tech	Module KS4:5 - Digital Ethics ☐ Data privacy and security ☐ The balance between privacy and security ☐ Ethical aspects of advancing tech ☐ Benefits of new technology ☐ Negative effects to watch of for ☐ Unintended consequences of tech	Revision
Summer Term 2	Module KS4:6 - AI Policy ☐ Data privacy and security ☐ The balance between privacy and security ☐ Data ownership, bias and fairness ☐ Generative AI in Education ☐ Social and Environmental impact ☐ AI-Powered Threats and Defenses	Module KS4:6 - AI Policy ☐ Data privacy and security ☐ The balance between privacy and security ☐ Data ownership, bias and fairness ☐ Generative AI in Education ☐ Social and Environmental impact ☐ AI-Powered Threats and Defenses	Exams

KS4 Computer Science Curriculum

	Year 9	Year 10	Year 11
Autumn Term 1	Introduction to text based programming using C#	Programming fundamentals Designing, creating and refining algorithms	Features of an IDE Programming Constructs System Design, Testing and Programming
Autumn Term 2	Data storage and structures BEBRAS UK Competition Advent of Code	Computational Thinking BEBRAS UK Competition Advent of Code	Legal issues and Ethics Use SQL to search for data BEBRAS UK Competition Advent of Code
Spring Term 1	Sorting Algorithms Computer hardware Computer Software	Sorting Algorithms Logic circuits Truth Tables Data Representation	Mock Revision and Mocks Sorting Algorithms Random Numbers File handling Pseudocode
Spring Term 2	Searching Algorithms Advanced Spreadsheets BEBRAS Coding Challenge	Searching Algorithms BEBRAS Coding Challenge	Sorting and Searching Algorithms Revision Paper 2 BEBRAS Coding Challenge
Summer Term 1	Computational Thinking	Architecture of the CPU CPU Performance Embedded systems Memory, Storage and Operating Systems Network Layers and Protocols	Revision Paper 1
Summer Term 2	Software Development Project	Ethics and Legal Issues Computer Networks	Exams

KS5 Computer Science Curriculum

	Year 12		Year 13
Autumn Term 1	Structure and Function of Processor Programming Techniques using C#/C++ Data Structures		Data Structures in depth Searching and sorting algorithms Exam practice Finish practice NEA Start NEA
Autumn Term 2	Software Development Databases BEBRAS UK Competition Advent of Code		Legal issues and Ethics Database analysis and design Path finding algorithms Big O notation
Spring Term 1	Web Technologies Software Development Practice NEA 1 - (Group Work) Networks		Revision and Exam practice Finish NEA
Spring Term 2	Types of Programming Language Compression, Encryption and Hashing BEBRAS Coding Challenge		Revision - Paper 2
Summer Term 1	Applications Generation Data Types Approaches to problem solving Practice NEA 2 - (Individual)		Revision - Paper 1
Summer Term 2	Boolean Algebra Consolidating knowledge, enrichment and progression activities.	Consolidating knowledge, enrichment and progression opportunities.	