

ICT

Preparing students for tomorrow, bit by bit

The Computing department will help to create, share, and apply knowledge in all branches of Computer Science and ICT. We will educate students to be successful, ethical, and effective problem-solvers with a passion to innovate and create, rather than just passive consumers and users of technology. We will develop an understanding and appreciation of all aspects of digital products, from how they work to how they look. We will foster curiosity and encourage exploration to create students who can contribute positively to the well-being of our society and who are prepared to tackle the complex 21st Century challenges facing the world.

Summary focus areas:

- Innovate, create, develop
- Solving 21st Century problems
- Active developers not passive consumers

Autumn		Spring		Summer
Advanced data handling (inc. SS vs DB)	Controlled assessment 2	Exam technique Systems in context	Exam revision and preparation	

Homework for ICT is set weekly to support and extend the students' studies from their lessons. Work may be a mixture of practical, computer-based tasks and paper-based written work or design tasks. Activities set as homework may be:

- Preparatory work or research ahead of a new topic or concept being discussed in lessons.
- Extension work that allows the student to explore a topic in more depth or in other contexts.
- Application work that allows students to practise skills or demonstrate abilities.

Students are expected to spend around an hour on a homework activity each week and work is marked promptly to help students to identify and understand their weaknesses to make incremental improvements over the course of the year.

Unit	Duration (lessons)	Learning Objectives/Outcomes
Advanced data handling (inc. SS vs DB)	10	<ul style="list-style-type: none"> • the features of spreadsheet software: cells, cell references, rows, columns (and their height and width), show row/column labels, enter and edit cell content, key fields, cell gridlines, cell ranges, replication, formatting, merging cells, formulae, functions, automatic recalculation, sorting rows/columns, graph/chart creation and development to suit numerical information (e.g. bar chart, pie chart, line graph, scattergram and the use of scales, a title, axis title and key/ legend), layout of worksheets and linked sheets • the features of modelling software: how a data model may be used to answer 'what if' questions and the benefit of being able to answer such questions using a data model • use of data modelling, formulae, functions, variables, different scenarios, verification (accuracy and plausibility), graphs and charts for predicting trends • the features of database software: field (column) and record (row), field names, key field (unique), primary key, file • create a database, insert/delete field/record, enter and edit field contents, organise and select records, view database structure, control the content of reports by selection of fields and use of headings, control the format of reports (header and footer), creation and development of charts/ graphs • typical tasks for which data handling software can be used: organising data, collecting data, amending existing data, deleting redundant data, select/search/filter records, sort on one or more fields (in ascending and descending order), merging data, report production • the use of relational databases and spreadsheets: flatfile vs relational databases • be able to compare and evaluate data handling methods and recommend systems for different situations with full justifications
Controlled assessment 2	26	<ul style="list-style-type: none"> • understand the requirements of the controlled assessment brief • be able to produce a fully working and documented solution to the given problem

Communications and Networks	4	<ul style="list-style-type: none"> • the main components of computer networks • network topologies • the advantages and disadvantages of using computer networks • the use of internal and external networks.
Data Security, Encryption, Malicious Software	4	<ul style="list-style-type: none"> • appropriate methods that could be used to make backups and archives • appropriate secure and safe practices that could be used • appropriate user security methods and devices that could be used: restricted physical access (e.g. biometric scans, electronic passes), restricted access to data (e.g. hierarchy of passwords, access rights, encryption), monitoring (e.g. transaction logs) • the procedures that could be used to minimise the risks of security breaches • how data encryption could be used within a defined context • the need for security of data and personal information when using ICT.
Environmental Impact of Technology	4	<ul style="list-style-type: none"> • environmental issues connected to the production, use and disposal of ICT systems, the effect on natural resources of the creation and use of ICT systems. • the environmental impact of digital devices: their use, deployment and eventual recycling and disposal
Exam technique	4	<ul style="list-style-type: none"> • recap the correct approaches for answering exam questions • have experience of answering a full range of exam-style questions
Systems in context	5	<ul style="list-style-type: none"> • understand the contextualised pre-release scenario and the range of technologies that may be used by the company • be able to respond questions by ensuring the answer is linked directly to the scenario • have experience of a range of contextualised questions
Exam revision and preparation	10	<ul style="list-style-type: none"> • understand a range of revision techniques to support exam preparation • recall knowledge from previous sections of the course