



Syllabus

Cambridge IGCSE™

Information and Communication Technology 0417

Use this syllabus for exams in 2023, 2024 and 2025.

Exams are available in the June and November series.

Exams are also available in the March series in India only.



Why choose Cambridge International?

Cambridge International prepares school students for life, helping them develop an informed curiosity and a lasting passion for learning. We are part of the University of Cambridge.

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'We think the Cambridge curriculum is superb preparation for university.'

Christoph Guttentag, Dean of Undergraduate Admissions, Duke University, USA



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Important: Changes to this syllabus

For information about changes to this syllabus for 2023, 2024 and 2025, go to page 40.



1 Why choose this syllabus?

Key benefits

Cambridge IGCSE is the world's most popular international qualification for 14 to 16 year olds, although it can be taken by students of other ages. It is tried, tested and trusted.

Students can choose from 70 subjects in any combination – it is taught by over 4800 schools in over 150 countries.

Our programmes balance a thorough knowledge and understanding of a subject and help to develop the skills learners need for their next steps in education or employment.

Cambridge IGCSE Information and Communication Technology provides learners with the ability to use a broad range of ICT skills and encourages knowledge and understanding of the development of ICT systems, networks and their safe use.

This course provides learners with the ability to understand the rapid change of ICT in a technology-based world and the impact ICT has on the world.

Learners in a modern ICT based world need to have the ability to gather, process and manipulate data; this course helps learners to fulfil this.

Our approach in Cambridge IGCSE Information and Communication Technology encourages learners to be:

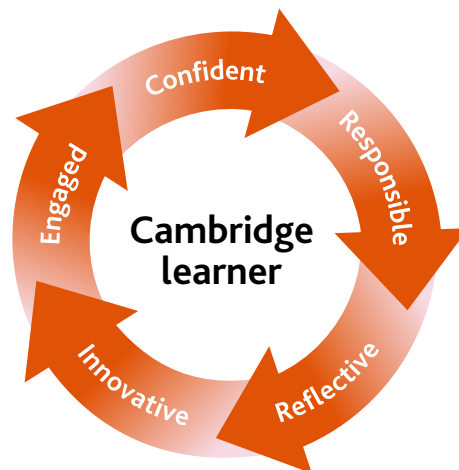
confident, in applying knowledge and understanding of ICT technologies and using skills to solve ICT problems, both as individuals and working with others

responsible, for themselves, responsive to and respectful of others with particular consideration to physical safety and eSafety

reflective, in their ability to learn and develop ICT skills

innovative, in the way that they use ICT-based solutions to solve problems and identify alternative solutions to solve problems

engaged, socially, in the work that they undertake and to interrogate unfamiliar situations to provide ICT-based solutions.



'The strength of Cambridge IGCSE qualifications is internationally recognised and has provided an international pathway for our students to continue their studies around the world.'

Gary Tan, Head of Schools and CEO, Raffles International Group of Schools, Indonesia

International recognition and acceptance

Our expertise in curriculum, teaching and learning, and assessment is the basis for the recognition of our programmes and qualifications around the world. The combination of knowledge and skills in Cambridge IGCSE Information and Communication Technology gives learners a solid foundation for further study. Candidates who achieve grades A* to C are well prepared to follow a wide range of courses including Cambridge International AS & A Level Information Technology.

Cambridge IGCSEs are accepted and valued by leading universities and employers around the world as evidence of academic achievement. Many universities require a combination of Cambridge International AS & A Levels and Cambridge IGCSEs or equivalent to meet their entry requirements.

UK NARIC, the national agency in the UK for the recognition and comparison of international qualifications and skills, has carried out an independent benchmarking study of Cambridge IGCSE and found it to be comparable to the standard of the reformed GCSE in the UK. This means students can be confident that their Cambridge IGCSE qualifications are accepted as equivalent to UK GCSEs by leading universities worldwide.

Learn more at www.cambridgeinternational.org/recognition

'Cambridge IGCSE is one of the most sought-after and recognised qualifications in the world. It is very popular in Egypt because it provides the perfect preparation for success at advanced level programmes.'

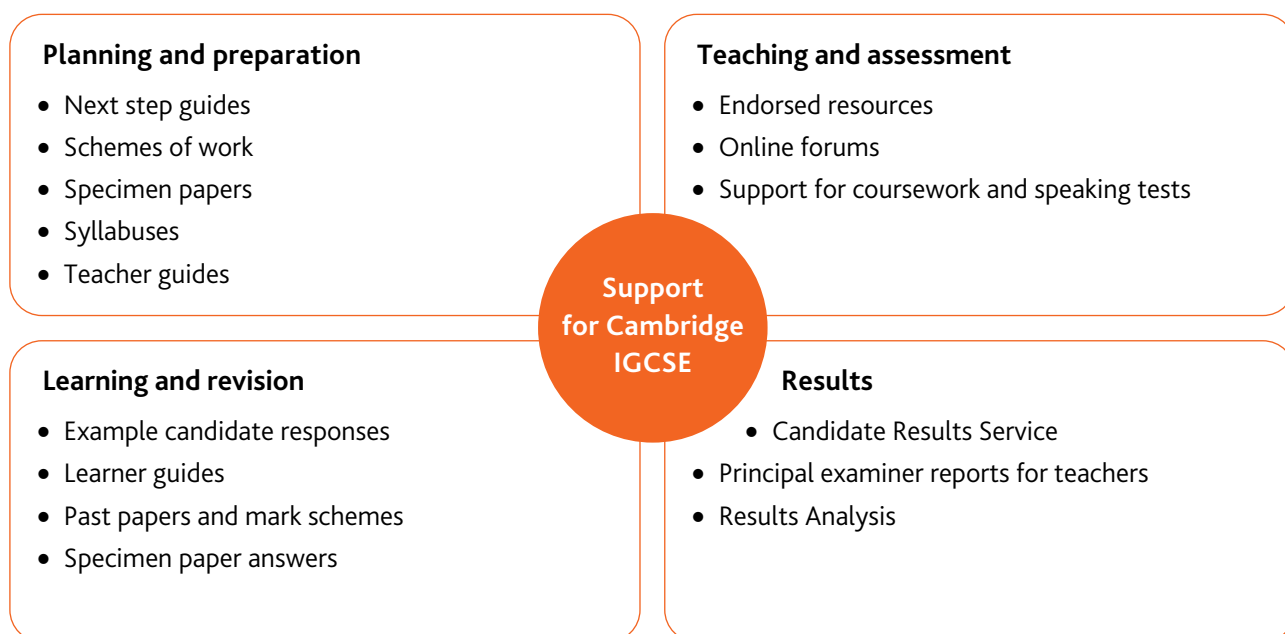
Managing Director of British School in Egypt BSE

Supporting teachers

We provide a wide range of resources, detailed guidance and innovative training and professional development so that you can give your students the best possible preparation for Cambridge IGCSE. To find out which resources are available for each syllabus go to our School Support Hub.

The School Support Hub is our secure online site for Cambridge teachers where you can find the resources you need to deliver our programmes. You can also keep up to date with your subject and the global Cambridge community through our online discussion forums.

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Sign up for email notifications about changes to syllabuses, including new and revised products and services at www.cambridgeinternational.org/syllabusupdates

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- Introductory Training – face-to-face or online
- Extension Training – face-to-face or online
- Enrichment Professional Development – face-to-face or online

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2 Syllabus overview

Aims

The aims describe the purposes of a course based on this syllabus.

The aims are to enable students to develop:

- an understanding of the basic components, use and application of different ICT systems and networks
- the skills to analyse, design, implement, test and evaluate ICT systems
- the skills to understand the impact of current and new technologies on methods of working in the outside world
- the ability to recognise potential risks when using ICT, and use safe, secure and responsible practice.

Cambridge Assessment International Education is an education organisation and politically neutral. The contents of this syllabus, examination papers and associated materials do not endorse any political view. We endeavour to treat all aspects of the exam process neutrally.



Content overview

- 1 Types and components of computer systems
- 2 Input and output devices
- 3 Storage devices and media
- 4 Networks and the effects of using them
- 5 The effects of using IT
- 6 ICT applications
- 7 The systems life cycle
- 8 Safety and security
- 9 Audience
- 10 Communication
- 11 File management
- 12 Images
- 13 Layout
- 14 Styles
- 15 Proofing
- 16 Graphs and charts
- 17 Document production
- 18 Databases
- 19 Presentations
- 20 Spreadsheets
- 21 Website authoring

Assessment overview

All candidates take three papers. Candidates will be eligible for grades A* to G.

All candidates take:

Paper 1 1 hour 30 minutes
Theory 40%
80 marks
Questions will be based on sections 1–21 of the subject content
All questions are compulsory
Externally assessed

and:

Paper 2 2 hours 15 minutes
Document Production, Databases and Presentations 30%
70 marks
This test assesses the practical skills needed to use the applications covered in sections 17, 18 and 19 of the subject content
Candidates must demonstrate the practical skills relevant to sections 11–16
All tasks are compulsory
Externally assessed

and:

Paper 3 2 hours 15 minutes
Spreadsheets and Website Authoring 30%
70 marks
This test assesses the practical skills needed to use the applications covered in sections 20 and 21 of the subject content
Candidates must demonstrate the practical skills relevant to sections 11–16
All tasks are compulsory
Externally assessed

Information on availability is in the **Before you start** section.

Assessment objectives

The assessment objectives (AOs) are:

AO1 Recall, select and communicate knowledge and understanding of ICT

AO2 Apply knowledge, understanding and skills to produce ICT-based solutions

AO3 Analyse, evaluate, make reasoned judgements and present conclusions

Weighting for assessment objectives

The approximate weightings allocated to each of the assessment objectives (AOs) are summarised below.

Assessment objectives as a percentage of the qualification

Assessment objective	Weighting in IGCSE %
AO1 Recall, select and communicate knowledge and understanding of ICT	32
AO2 Apply knowledge, understanding and skills to produce ICT-based solutions	60
AO3 Analyse, evaluate, make reasoned judgements and present conclusions	8
Total	100

Assessment objectives as a percentage of each component

Assessment objective	Weighting in components %		
	Paper 1	Paper 2	Paper 3
AO1 Recall, select and communicate knowledge and understanding of ICT	80	–	–
AO2 Apply knowledge, understanding and skills to produce ICT-based solutions	–	100	100
AO3 Analyse, evaluate, make reasoned judgements and present conclusions	20	–	–
Total	100	100	100

3 Subject content

This syllabus gives you the flexibility to design a course that will interest, challenge and engage your learners. Where appropriate you are responsible for selecting resources and examples to support your learners' study. These should be appropriate for the learners' age, cultural background and learning context as well as complying with your school policies and local legal requirements.

The following information identifies content which must be covered within all topics. Where the term 'including' is used, everything listed must be studied. However, this list is not exhaustive and other related aspects should also be studied.

Note that no marks are awarded for brand names of software packages or hardware in candidate responses.

1 Types and components of computer systems

1.1 Hardware and software

Candidates should know and understand:

Hardware

Notes and Guidance

Hardware consists of the physical components of a computer system

Internal components including Central Processing Unit (CPU), processor, motherboard

Internal memory including random access memory (RAM), read-only memory (ROM)

Hardware components including graphics card, sound card, Network Interface Card (NIC), camera, internal/external storage devices, input and output devices

Software

Software are programs for controlling the operation of a computer or processing of electronic data

Applications software provides the services that the user requires to solve a task

Examples of applications software including word processing, spreadsheet, database management systems, control, measurement, applets and apps, video editing, graphics editing, audio editing, computer aided design (CAD)

System software provides the services that the computer requires to operate

Examples of system software including compilers, linkers, device drivers, operating systems and utilities

Analogue and digital data

Characteristics of analogue and digital data

Differences between analogue and digital data

The need to convert:

- analogue to digital data so it can be processed by a computer
- digital data to analogue data so it can be used to control devices

1.2 The main components of computer systems

Candidates should know and understand:

Central Processing Unit (CPU)

Internal memory

Input and output devices

Backing storage

Notes and Guidance

The role of the CPU in processing instructions entered into the computer in order to produce an output

Characteristics of ROM and RAM
Differences between ROM and RAM

Characteristics of input and output devices
Differences between input and output devices

Characteristics of backing storage
Differences between backing storage and internal memory

1.3 Operating systems

Candidates should know and understand:

Operating systems

Notes and Guidance

Characteristics of operating systems including: Command Line Interface (CLI), Graphical User Interface (GUI), dialogue based and gesture based interface

Differences between types of operating systems

Advantages and disadvantages of the different types of operating systems

1.4 Types of computer

Candidates should know and understand:

Desktop computer

Mobile computers

Notes and Guidance

Characteristics of a desktop computer
Uses of a desktop computer including office and business management, education, gaming and entertainment

Characteristics of mobile computers including laptop computers, smartphones, tablet and phablet computers

Uses of mobile computers including office and business management, education, gaming, entertainment and remotely controlled devices

Advantages and disadvantages of the different types of computer including portability and expandability

1.5 Emerging technologies

Candidates should know and understand:

Impact of emerging technologies

Notes and Guidance

Impact on everyday life including Artificial Intelligence (AI), extended reality (virtual and augmented)

2 Input and output devices

2.1 Input devices and their uses

Candidates should know and understand:

Input devices

Notes and Guidance

Characteristics, uses, advantages and disadvantages of input devices including: keyboard, numeric keypad, pointing devices, remote control, joystick/driving wheel, touch screen (as an input device), scanners, camera, microphone, sensors, light pen

2.2 Direct data entry and associated devices

Candidates should know and understand:

Direct data entry

Notes and Guidance

Characteristics, uses, advantages and disadvantages of direct data entry devices including: magnetic stripe reader, chip and PIN reader, Radio Frequency Identification (RFID) reader, Optical Mark Recognition/Reader (OMR), Optical Character Recognition/Reader (OCR), bar code reader, QR scanner

2.3 Output devices and their uses

Candidates should know and understand:

Output devices

Notes and Guidance

Characteristics, uses, advantages and disadvantages of output devices including: monitors, touch screen (as an output device), multimedia projector, laser printer, inkjet printer, dot matrix printer, plotter, 3D printers, speaker, actuator

3 Storage devices and media

Candidates should know and understand:

Storage devices

Notes and Guidance

Characteristics, uses, media, advantages and disadvantages of storage devices including magnetic, optical and solid-state

Magnetic drives including fixed and portable magnetic hard drives, magnetic tape drives

Optical drives including CD, DVD, Blu-ray

Fixed and portable solid-state drive (SSD) including SSD, pen drive, flash drive

Storage media

Characteristics, uses, advantages and disadvantages of storage media including magnetic, optical and solid-state

Magnetic drives including magnetic hard disks, magnetic tape

Optical discs including CD, DVD, Blu-ray

Solid-state media including memory cards (SD, xD, CFast)

4 Networks and the effects of using them

4.1 Networks

Candidates should know and understand:

Router

Notes and Guidance

The operation and purpose of a router including:

- connecting networks and devices to the internet
- storing computer addresses in a router
- routing data packets

Common network devices

Including: network interface cards (NIC), hubs, bridges, switches

wi-fi and Bluetooth

The uses of wi-fi and Bluetooth

Connecting a device to a network using:

- wi-fi
- Bluetooth

Similarities and differences between Bluetooth and wi-fi

Cloud computing

The characteristics, uses and issues relating to cloud computing

How data is stored, managed and shared using cloud computing

Advantages and disadvantages of using cloud storage compared to other methods

4.1 Networks continued

Candidates should know and understand:

Common network environments

Notes and Guidance

Characteristics, uses and purpose of an extranet, intranet and the internet

The differences and similarities between an extranet, intranet and the internet

Network types

Local Area Network (LAN), Wireless Local Area Network (WLAN), Wide Area Network (WAN) and the differences between these networks

4.2 Network issues and communication

Candidates should know and understand:

Security issues regarding data transfer

Notes and Guidance

Privacy and confidentiality of data transfer

Passwords

Avoiding password interception by using up to date anti-spyware and regularly changing passwords

The differences between strong and weak passwords

Other authentication methods

Including: zero login, biometric methods, magnetic stripes, smart cards, physical tokens, electronic tokens

Anti-malware software

Including the use of anti-malware and anti-virus software

The operation of removing/quarantining viruses using up to date software

Scanning the storage media used to transfer data

Scanning the data/software when downloading

Electronic conferencing

Characteristics, uses, advantages and disadvantages of video-conferencing, audio-conferencing, web-conferencing

The hardware, software and network connection required to set up each type of electronic conference

5 The effects of using IT

5.1 Microprocessor-controlled devices

Candidates should know and understand:

The effects of using microprocessor-controlled devices

Notes and Guidance

The positive and negative effects of microprocessors/ smart devices in monitoring and controlling devices in the home including the impact on lifestyle, leisure time, physical fitness, security of data, the degree of social interaction

The positive and negative effects of microprocessors/ smart devices in monitoring and controlling transport including security of data, autonomous vehicles, transport safety

5.2 Potential health problems related to the prolonged use of IT equipment

Candidates should know and understand:

Health issues

Notes and Guidance

Including: repetitive strain injury (RSI), back problems, eye problems, headaches

The causes of these health issues and strategies for preventing them

6 ICT applications

6.1 Communication

Candidates should know and understand:

Communication media

Notes and Guidance

Characteristics and uses including newsletters, posters, websites, multimedia presentations, audio, video, media streaming and ePublications

Mobile communication

The use of mobile devices for communication including: SMS messaging, phone calls, Voice over Internet Protocol (VoIP), video calls, accessing the internet

6.2 Modelling applications

Candidates should know and understand:

Computer modelling

Notes and Guidance

Including: personal finance, bridge and building design, flood water management, traffic management, weather forecasting

Advantages and disadvantages of using computer modelling rather than humans

6.3 Computer controlled systems

Candidates should know and understand:

Computer controlled systems

Notes and Guidance

Including: robotics in manufacture, production line control, autonomous vehicles

Advantages and disadvantages of using computer controlled systems rather than humans

6.4 School management systems

Candidates should know and understand:

School management systems

Notes and Guidance

Systems are used to manage learner registration and attendance

Systems are used to record learner performance including computer aided learning

6.5 Booking systems

Candidates should know and understand:

Online booking systems

Notes and Guidance

Characteristics, uses, advantages and disadvantages of online booking systems including travel industry, concerts, cinemas, sporting events

6.6 Banking applications

Candidates should know and understand:

Banking applications

Notes and Guidance

Characteristics, uses, advantages and disadvantages of Automatic Teller Machines (ATM) including: withdrawing cash, depositing cash or cheques, checking account balance, mini statements, bill paying, money transfers

Characteristics, uses, advantages and disadvantages of Electronic Funds Transfer (EFT), credit/debit card transactions, cheques, internet banking

6.7 Computers in medicine

Candidates should know and understand:

Information systems in medicine

Notes and Guidance

Characteristics and uses of patient records, pharmacy records

3D printers

Including printing of prosthetics, tissue engineering, artificial blood vessels, customised medicines

6.8 Expert systems

Candidates should know and understand:

Expert systems

Notes and Guidance

Characteristics, uses and purpose of expert systems including mineral prospecting, car engine fault diagnosis, medical diagnosis, chess games, financial planning, route scheduling for delivery vehicles, plant and animal identification

Components of an expert system: user interface, inference engine, knowledge base, rules base, explanation system

How an expert system is used to produce possible solutions for different scenarios

6.9 Computers in the retail industry

Candidates should know and understand:

Computers in the retail industry

Notes and Guidance

Characteristics and uses of computers in the retail industry including point of sale (POS) terminals and electronic funds transfer at point of sale (EFTPOS) terminals

Point of sale (POS) terminals including updating stock files automatically and ordering new stock automatically

Electronic funds transfer at point of sale (EFTPOS) terminals including checking of the validity of cards, the use of chip and PIN, the use of contactless cards, the use of Near Field Communication (NFC) payment, the communication between the supermarket computer and the bank computer

Internet shopping

Characteristics, advantages and disadvantages of internet shopping

6.10 Recognition systems

Candidates should know and understand:

Recognition systems

Notes and Guidance

Characteristics, uses, advantages and disadvantages of:
Optical Mark Recognition (OMR) including school registers, multiple-choice examination papers, barcode, QR code

Optical Character Recognition (OCR) including automated number plate recognition (ANPR) systems
Radio Frequency Identification Device (RFID) including tracking stock, passports, automobiles, contactless payment

Near Field Communication (NFC) including payment using a smartphone

Biometric recognition including face, iris, retina, finger, thumb, hand, voice

6.11 Satellite systems

Candidates should know and understand:

Satellite systems

Notes and Guidance

Characteristics, uses, advantages and disadvantages of satellite systems including Global Positioning Systems (GPS), satellite navigation, Geographic Information Systems (GIS), media communication systems (satellite television, satellite phone)

7 The systems life cycle

7.1 Analysis

Candidates should know and understand:

Analysis of the current system

Notes and Guidance

Characteristics, uses, advantages and disadvantages of the research methods of observation, interviews, questionnaires and examination of existing documents

Record and analyse information about the current system

The need to identify the inputs, outputs and processing of the current system, problems with the current system, the user and information requirements for the new system

System specification

Identify and justify suitable hardware and software for the new system

7.2 Design

Candidates should know and understand:

Design

Notes and Guidance

Design file/data structures, input formats, output formats and validation routines

File/data structures including field length, field name, data type, coding of data for example M for male, F for female

Validation routines including range check, character check, length check, type check, format check, presence check, check digit

Input formats including data capture forms

Output formats including screen layouts and report layouts

7.3 Development and testing

Candidates should know and understand:

Testing

Notes and Guidance

The need to test the system before implementation

Test designs, test strategies, test plan (test data, expected outcomes, actual outcomes, remedial action) following testing

Test designs including the testing of data structures, file structures, input formats, output formats and validation routines

Test strategies including to test each module, each function and the whole system

The definition, characteristics and use of test data using normal, abnormal and extreme data

The use of live data

7.4 Implementation

Candidates should know and understand:

System implementation

Notes and Guidance

Characteristics, uses, advantages and disadvantages of the four methods of implementation, direct changeover, parallel running, pilot running, phased implementation

7.5 Documentation

Candidates should know and understand:

Documentation

Notes and Guidance

Characteristics, uses and purpose of technical and user documentation

Components of technical documentation including: purpose of the system/program, limitations of the system, program listing, program language, program flowcharts/algorithms, system flowcharts, hardware and software requirements, file structures, list of variables, input format, output format, sample runs/test runs, validation routines

Components of user documentation including: purpose of the system, limitations of the system, hardware and software requirements, how to load/run/install software, how to save a file, how to print data, how to add records, how to delete/edit records, input format, output format, sample runs, error messages, error handling, troubleshooting guide/helpline, frequently asked questions, glossary of terms

7.6 Evaluation

Candidates should know and understand:

Evaluate a solution

Notes and Guidance

Evaluate a solution including the efficiency of the solution, the ease of use of the solution, and the appropriateness of the solution

Compare the solution with the original task requirements, identify any limitations and necessary improvements to the system, evaluate the users' responses to the results of testing the system

8 Safety and security

8.1 Physical safety

Candidates should know and understand:

Safety issues

Notes and Guidance

Including: electrocution from spilling drinks near electrical equipment and touching live cables, fire from sockets being overloaded or equipment overheating, tripping over trailing cables, heavy equipment falling and injuring people

The causes of these safety issues and strategies for preventing them

8.2 eSafety

Candidates should know and understand:

Data protection

Notes and Guidance

The principles of a typical data protection act and why data protection legislation is required

Personal data

Characteristics of personal and sensitive data including personal name, address, date of birth, a photograph in school uniform, medical history

The need for personal data to be kept confidential and protected to avoid inappropriate disclosure

eSafety

The need for eSafety when using the internet, email, social media, online gaming

Minimise the potential danger of using:

The internet including only using trusted websites recommended by teachers, using a search engine that only allows access to age appropriate websites

Email including an awareness of the potential dangers of opening or replying to an email from an unknown person. An awareness of the risks associated with sending personal identifiable data or images via email

continued

8.2 eSafety continued

Candidates should know and understand:

eSafety continued

Notes and Guidance

Social media including knowing how to block and report unwanted users, an awareness of the potential dangers of meeting an online contact face to face, avoiding the distribution of inappropriate images, avoiding the use of inappropriate language, respecting confidentiality of personal data of other people

Online gaming including not using real names, not giving out personal or financial data

8.3 Security of data

Candidates should know and understand:

Threats to data

Notes and Guidance

Characteristics and effect of threats to data including hacking, phishing, pharming, smishing, vishing, viruses, malware, card fraud

Hacking including the measures that must be taken in order to protect data

Phishing, pharming, smishing, vishing including the methods that can be used to help prevent them

Viruses and malware including how to take preventative action to avoid the danger of infecting a computer from a downloaded file

Card fraud including shoulder surfing, card cloning, key logging

Protection of data

Characteristics and methods of protecting data including biometrics, digital certificate, secure socket layer (SSL), encryption, firewall, two-factor authentication, user id and password

Biometrics including the use of biometric data

Digital certificate including its purpose and contents

Secure socket layer (SSL) including encrypted links between the server and the client computer

Encryption including its purpose for the protection of data on hard discs, email, cloud, HTTPS websites

Firewall including its purpose

Two-factor authentication including its purpose and function

User id and password including how they are used to increase the security of data

9 Audience

9.1 Audience appreciation

Candidates should know and understand:

Audience appreciation

Notes and Guidance

Show a clear sense of audience and purpose

Planning ICT solutions that are responsive to and respectful of the needs of an audience

Analyse the needs of an audience when creating ICT solutions

9.2 Copyright

Candidates should know and understand:

Copyright

Notes and Guidance

The need for copyright legislation and the principles of copyright relating to computer software (e.g. software piracy)

The methods that software producers employ to prevent software copyright legislation being broken

10 Communication

10.1 Communication with other ICT users using email

Candidates should know and understand:

email

Notes and Guidance

Characteristics, uses and constraints of email communication including acceptable language, guidelines set by an employer, the need for security, netiquette, email groups, carbon copy (cc), blind carbon copy (bcc), forward, attachments

Characteristics and effects of spam email including the methods which can be used to help prevent spam

10.2 Effective use of the internet

Candidates should know and understand:

The internet

Notes and Guidance

Characteristics, uses, advantages and disadvantages of using the internet including the differences between the internet, an intranet, an extranet and the World Wide Web (WWW), blog, forum, wiki, social networking

Functionality including Internet Service Provider (ISP), structure of a web address, Uniform Resource Locator (URL), hyperlink, web browser

Use of search engine including speed of searching, amount of information, the speed of finding relevant information, ease of finding reliable information

Evaluating the information found on the internet including how up to date, reliable, biased and valid this information is

Internet protocols including HyperText Transfer Protocol (HTTP), HyperText Transfer Protocol secure variant (HTTPS), File Transfer Protocol (FTP), Secure Socket Layer (SSL)

Risks of using the internet including inappropriate and criminal material, restricting data through parental, educational and ISP control

11 File management

11.1 Manage files effectively

Candidates should be able to:

Manage files

Notes and Guidance

Locate stored files

Open and import files of different types

Save files in a planned hierarchical directory/folder structure

Save files using appropriate file names

Save and print files in a variety of formats including a document, screenshots, database reports, data tables, graphs/charts, a web page in browser view, a web page in HTML view

Save and export in the file format of an application package including .docx, .doc, .xlsx, .xls, .sdb, .sdc, .accdb, .odb, .rtf, .pptx, .ppt

Save and export in a generic file format including .csv, .txt, .rtf, .pdf, .css, .htm, .jpg, .png

Candidates should know and understand:

File formats

Characteristics and uses of file formats including css, csv, gif, htm, jpg, pdf, png, rtf, txt, zip, rar

The need for generic file formats

11.2 Reduce file sizes for storage or transmission

Candidates should be able to:

Compress files

Notes and Guidance

Reduce file sizes for storage or transmission where necessary using file compression including .zip, .rar

Candidates should know and understand:

File compression

The need to reduce file sizes for storage or transmission

12 Images

Candidates should be able to:

Place and edit an image

Notes and Guidance

Place an image with precision

Resize an image as specified to maintain or adjust the aspect ratio of an image

Crop an image

Rotate an image

Reflect (flip) an image horizontally or vertically

Adjust the brightness of an image

Adjust the contrast of an image

Group and layer images including grouping and ungrouping, moving to the front or back

Candidates should know and understand:

File size reduction

Recognise that reducing the file size can be achieved by reducing the image resolution or colour depth

13 Layout

Note: In this section 'document' relates to any of the applications used within sections 16 to 21.

13.1 Create or edit a document

Candidates should be able to:

Create a new document, or edit an existing document

Notes and Guidance

Enter and modify text and numbers with total accuracy

Use editing techniques to manipulate text and numbers including highlight, delete, move, cut, copy, paste, drag and drop

Place objects into the document from a variety of sources including text, image, screenshot, shapes, table, graph or chart, spreadsheet extract, database extract

Wrap text around a table, chart or image including above, below, square and tight

13.2 Tables

Candidates should be able to:

Work with tables within documents

Notes and Guidance

Create a table with a specified number of rows and columns

Place text or objects in a table

Edit a table and its contents including insert row(s) and column(s), delete row(s) and column(s), merge cells

Format a table including to set horizontal cell alignment (left, right, centre, fully justified), set vertical cell alignment (top, middle, bottom), show gridlines, hide gridlines, wrap text within a cell, shading/colouring cells, adjust row height, adjust column width

13.3 Headers and footers

Candidates should be able to:

Use headers and footers appropriately within a range of software packages

Notes and Guidance

Create or edit headers and footers

Align the contents of the header and footer consistently within a document including to left margin, right margin and centred within margins

Place text and automated objects in headers and footers including file information, page numbering, total number of pages, date, time

Candidates should know and understand:

The purpose of headers and footers

14 Styles

Candidates should be able to:

Create, edit and apply styles

Notes and Guidance

Create, modify, update and apply styles to ensure consistency of presentation

Font including font face, type (serif, sans-serif), point size, colour

Text alignment including left, right, centre, fully justified

Text enhancement including bold, underline, italic

Spacing including paragraph (before and after) and line

Bullets including shape, alignment, line spacing and indent

Candidates should know and understand:

Corporate house style

Purpose and uses of a corporate house style

15 Proofing

15.1 Software tools

Candidates should be able to:

Reduce errors

Notes and Guidance

Use automated software tools (spell check, grammar check) and make appropriate changes to ensure all work produced contains as few errors as possible

Use validation routines to minimise data entry errors

Candidates should know and understand:

Spell check software

Automated suggestions given by spell check software do not always give the correct response

Validation checks

Importance, characteristics and uses of appropriate validation including range check, character check, length check, type check, format check, presence check

15.2 Proofing techniques

Candidates should be able to:

Perform visual verification

Notes and Guidance

Identify and correct data entry errors including transposed numbers, incorrect spelling, inconsistent character spacing, inconsistent case

Proofread

Identify and correct inconsistent line spacing, remove blank pages/slides, remove widows/orphans, inconsistent or incorrect application of styles, ensure that tables and lists are not split over columns or pages/slides

Candidates should know and understand:

Verification

Importance, characteristics and uses of verification including visual checking and double data entry to reduce data entry errors

The need for validation as well as verification

16 Graphs and charts

Candidates should be able to:

Create, label and edit a graph or chart

Notes and Guidance

Select data to produce a graph or chart including using contiguous data, non-contiguous data and specified data ranges

Select the graph or chart type

Label the graph or chart including chart title, legend, sector labels, sector values, percentages, category axis title, value axis title, category axis labels, value axis labels, data value labels

Add a second data series

Add a second axis

Format numerical values to a specified number of decimal places

Format numerical values to display currency symbols

Adjust the maximum and minimum values of an axis scale and set incremental values

Enhance the appearance of a graph or chart including extracting a pie chart sector, changing the colour scheme or fill patterns

17 Document production

Candidates should be able to:

Organise page layout

Notes and Guidance

Edit page layout including page size, page orientation, page margins, number of columns, column width, spacing between columns, set and remove breaks (page, section and column breaks)

Format text

Set line spacing including: single, 1.5 times, double, multiple, spacing before and after paragraphs

Set tabulation including: left, right, centred and decimal tabs, indented paragraphs and hanging paragraphs

Text enhancement including bold, underline, italic, superscript and subscript, changes in case

Create or edit lists including bulleted, numbered

Find and replace text

Including matching case, whole words

Navigation

Add and delete bookmarks/hyperlinks

Candidates should know and understand:

Pagination

The purpose of setting page, section and column breaks

Gutter margin

The purpose of setting gutter margins

18 Databases

18.1 Create a database structure

Candidates should be able to:

Create an appropriate database structure

Notes and Guidance

Import data from existing files (including .csv, .txt) using specified field names to create tables

Set appropriate data types to fields including text, numeric (integer, decimal, currency), date/time, Boolean/logical

Set sub-types of numeric data including percentage, number of decimal places

Set display format of Boolean/logical field (yes/no, true/false, checkbox)

Set display format of date/time data

Create and edit primary and foreign keys

Create relationships between tables

Create and use a data entry form

Create a data entry form including specified fields, appropriate font styles and sizes, appropriate spacing between fields, character spacing of individual fields, use of white space, radio buttons, check boxes, drop down menus

Candidates should know and understand:

Types of database

Characteristics, uses, advantages and disadvantages of a flat file and a relational database

Primary and foreign keys

Characteristics of primary key and foreign keys

Form design

Characteristics of good form design

18.2 Manipulate data

Candidates should be able to:

Perform calculations

Notes and Guidance

Use arithmetic operations or numeric functions to perform calculations including calculated fields, calculated controls

Use formulae and functions to perform calculations at run time including addition, subtraction, multiplication, division, sum, average, maximum, minimum, count

Sort data

Use a single criterion, or multiple criteria to sort data into ascending or descending order

Search and select data

Use a single criterion, or multiple criteria to select subsets of data using a query

perform searches using a variety of operators including AND, OR, NOT, LIKE, >, <, =, >=, <=, <>

perform searches using wildcards

18.3 Present data

Candidates should be able to:

Display data

Notes and Guidance

Produce reports to display data including displaying all the required data and labels in full

Use appropriate headers and footers within a database report including report header, report footer, page header, page footer

Set report titles

Produce different output layouts including controlling the display of data, labels, tabular or columnar format

Align data and labels appropriately including right aligning numeric data and decimal alignment

Control the display format of numeric data including number of decimal places, currency symbol, percentage

19 Presentations

Candidates should be able to:

Create a presentation

Use a master slide

Edit a presentation

Notes and Guidance

Create a new presentation using a text file

Insert and edit objects consistently including images, text, shapes, logos, slide headers and footers, placeholder position, automated slide numbering

Format master slide objects including headings, subheadings, bullets, background colour

Apply slide layout

Insert a new slide

Move or delete a slide

Insert and edit objects on a slide including text (headings, subheadings, bulleted lists), images (still images, video clips, animated images), charts, tables, audio clips (sound), symbols, lines, arrows, call out boxes and shapes

Add presenter notes

Insert and edit a hyperlink including linking text or objects to a slide within the presentation, an external file or an email address

Insert an action button including modifying settings to navigate to a specified slide or file

Add alternative text/screentip to an object

Apply consistent transitions between slides

Apply consistent animation effects on text, images and other objects

Hide slides within a presentation

19 Presentations continued

Candidates should be able to:

Output the presentation

Notes and Guidance

Display the presentation for a variety of purposes including looped on-screen carousel, presenter controlled

Print the presentation in a variety of layouts including full page slides, presenter notes, handouts

20 Spreadsheets

20.1 Create a data model

Candidates should be able to:

Create and edit a spreadsheet model

Notes and Guidance

Insert cell(s), row(s) and column(s), delete cell(s), row(s) and column(s), merge cells

Create formulae using cell references

Replicate formulae using absolute and relative cell references where appropriate

Use arithmetic operators in formulae including add, subtract, multiply, divide, indices

Use named cells and named ranges

Use functions including sum, average, maximum, minimum, integer, rounding, counting, LOOKUP, VLOOKUP, HLOOKUP, XLOOKUP, IF

Use external data sources within functions

Use nested functions

Candidates should know and understand:

Formulae and functions

The difference between a formula and a function

Order of operations

The order in which mathematical operations are performed including the use brackets to make sure that formulae work

Cell referencing

Characteristics and use of absolute and relative cell referencing

20.2 Manipulate data

Candidates should be able to:

Sort data

Notes and Guidance

Using a single criterion, or multiple criteria sort data into ascending or descending order

Search and select data

Using a single criterion, or multiple criteria, select subsets of data

Perform searches using a variety of operators including AND, OR, NOT, >, <, =, >=, <=, <>

Perform searches using wildcards

20.3 Present data

Candidates should be able to:

Adjust the display features

Notes and Guidance

Display either formulae or values

Adjust row height, column width and cell sizes so that all data, labels, and formulae is fully visible

Wrap text within cells so that all data is fully visible

Hide and display rows and columns

Format a spreadsheet

Enhance a spreadsheet including text colour, cell colour, bold, underline, italic, shading

Format numeric data appropriately including to display the number of decimal places, different currency symbols, percentages

Use conditional formatting to change the display format depending on the contents of a cell

Set page layout

Set the orientation to portrait or landscape

Control the page layout to print including specified number of pages, print area, display or hide gridlines, display or hide row and column headings

21 Website authoring

21.1 Web development layers

Candidates should know and understand:

The three web development layers

Notes and Guidance

Content layer is used to enter the content and create the structure of a web page

Presentation layer is used to display and format elements within a web page

Behaviour layer is for a scripting language to control elements within a web page

21.2 Create a web page

Candidates should be able to:

Use HTML in the content layer

Notes and Guidance

Create the content layer of a web page

Place appropriate elements in the head section of a web page including:

- insert a page title to display in the browser
- attach external stylesheets (with the correct hierarchy, using a relative file path)
- metatags to use the appropriate attributes including to define the charset, name attributes (description, keywords, author, viewport), content attributes
- default target windows

Place appropriate content in the body section of a web page

Insert a table including table header, table rows, table data

Use appropriate table attributes to meet the needs of the audience including to adjust cells to span more than one row or column, to set table and cell sizes in terms of pixels or % values, to apply styles to tables

Insert appropriate objects into a web page including text, images, sound clips, video (display controls, remove controls, autoplay), to adjust image or video size, aspect ratio and apply alternate text

Use the <div> tag including to apply styles and classes

Apply tags to text within a web page to display pre-defined styles including h1, h2, h3, p, li

Apply classes to elements within a web page

Apply styles to elements within a web page including to a list (ordered list, unordered list)

Create a bookmark within a web page using an id attribute

Create hyperlinks from text and images to:

- bookmarks on the same page
- other locally stored web pages
- a website using the URL
- send mail to a specified email address
- to open in a specified location (the same window, a new window, with a window named as specified)

continued

21.2 Create a web page continued

Candidates should know and understand:

The use of HTML in the content layer

Notes and Guidance

Purpose of the head and body sections of a web page

The reason tables are used to structure elements within a web page

Function of metatags including to define: the charset, keywords for search engines, the author of the web page, a description of the web page, the viewport (to make your web page display on all devices)

Function of a hyperlink

Concept of a bookmark including methods of creating a bookmark within a web page

Function of an anchor

Relative file path and absolute file path including the reason absolute file paths must not be used for hyperlinks to locally saved web pages/objects

21.3 Use stylesheets

Candidates should be able to:

Use CSS in the presentation layer

Notes and Guidance

Create the presentation layer of a web page

Create generic external styles and inline style attributes including:

- background properties including colour, images
- font properties
- table, table row, table header and table data properties including size, background colour, horizontal and vertical alignment, spacing, padding, borders: including collapsed, colour, thickness, visible/invisible

Create classes including:

- background properties including colour, images
- font properties
- table, table row and table data properties including size, background colour, horizontal and vertical alignment, spacing, padding, borders: including collapsed, colour, thickness, visible/invisible

Create external styles to be tagged in a web page including h1, h2, h3, p, li

Specify the font properties including font family, size, colour, alignment, bold, italic

Attach comments to an external stylesheet

Save styles in cascading stylesheet format

continued

21.3 Use stylesheets continued

Candidates should know and understand:

The use of CSS in the presentation layer

Notes and Guidance

Characteristics of cascading stylesheets including the difference between attached stylesheets and inline style attributes, the hierarchy of multiple attached stylesheets and inline styles within a web page

Characteristics of a style and a class including the difference between them

Reason relative file paths must be used for attached stylesheets

4 Details of the assessment

Paper 1 – Theory

Written paper, 1 hour 30 minutes, 80 marks

This is a compulsory paper consisting of multiple-choice, short-answer and structured questions. The questions are set on all sections of the subject content. Each individual question is set within separate contexts of ICT applications in everyday life.

Candidates must answer **all** questions. Candidates answer on the question paper.

Paper 2 – Document Production, Databases and Presentations

Practical test, 2 hours 15 minutes, 70 marks

For Paper 2 Document Production, Databases and Presentations, candidates must **not** have access to the internet or email. For each of the tasks, candidates will be provided with electronic source files; these files must be loaded onto the candidates' computer system before the start of the examination. Please refer to the *Cambridge Handbook* for full details on the administration of this paper.

This is a compulsory paper. It is a practical test which comprises a number of tasks to be taken under examination conditions and focuses on the candidate's ability to carry out practical tasks by applying their knowledge and understanding to the following subject content sections:

- Section 17 Document production
- Section 18 Databases
- Section 19 Presentations.

Candidates demonstrate the practical skills relevant to sections 11–16.

Candidates work through the steps of each task in order. Candidates are prompted to produce evidence of their work by creating screenshots and placing these within an Evidence Document and making printouts. It is essential that candidates remember to enter **electronically** their centre number, candidate number and name on each piece of evidence before it is sent to the printer.

Paper 3 – Spreadsheets and Website Authoring

Practical test, 2 hours 15 minutes, 70 marks

For Paper 3 Spreadsheets and Website Authoring, candidates must **not** have access to the internet or email. For each of the tasks, candidates will be provided with electronic source files; these files must be loaded onto the candidates' computer system before the start of the examination. Please refer to the *Cambridge Handbook* for full details on the administration of this paper.

This is a compulsory paper. It is a practical test which comprises a number of tasks to be taken under examination conditions and focuses on the candidate's ability to carry out practical tasks by applying their knowledge and understanding to the following subject content sections:

- Section 20 Spreadsheets
- Section 21 Website authoring.

Candidates demonstrate the practical skills relevant to sections 11–16.

Candidates work through the steps of each task in order. Candidates are prompted to produce evidence of their work by creating screenshots and placing these within an Evidence Document and making printouts. It is essential that candidates remember to enter **electronically** their centre number, candidate number and name on each piece of evidence before it is sent to the printer.

Notes for guidance

Hardware and software requirements

Assessment of the practical tests is software independent, therefore any hardware platform, operating system and applications packages can be used by candidates in the practical examinations, provided that these packages have the facilities to enable the candidates to fully demonstrate all of the skills, performance criteria and assessment objectives in sections 11–21.

It is recommended that for the website authoring section of the syllabus, candidates have a working knowledge of HTML and CSS. They may use suitable web editing software to assist them, but they will be required to edit the mark-up generated by such a package, or they may create their own HTML and CSS.

There will be no requirement for candidates to use any scripting language.

Command words

Command words and their meanings help candidates know what is expected from them in the exams. The table below includes command words used in the assessment for this syllabus. The use of the command word will relate to the subject context.

Command word	What it means
Analyse	examine in detail to show meaning, identify elements and the relationship between them
Compare	identify/comment on similarities and/or differences
Contrast	identify/comment on differences
Define	give precise meaning
Demonstrate	show how or give an example
Describe	state the points of a topic / give characteristics and main features
Discuss	write about issue(s) or topic(s) in depth in a structured way
Evaluate	judge or calculate the quality, importance, amount, or value of something
Explain	set out purposes or reasons / make the relationships between things evident / provide why and/or how and support with relevant evidence
Give	produce an answer from a given source or recall/memory
Identify	name/select/recognise
Justify	support a case with evidence/argument
State	express in clear terms
Suggest	apply knowledge and understanding to situations where there are a range of valid responses in order to make proposals / put forward considerations

5 What else you need to know

This section is an overview of other information you need to know about this syllabus. It will help to share the administrative information with your exams officer so they know when you will need their support. Find more information about our administrative processes at www.cambridgeinternational.org/eoguide

Before you start

Previous study

We do not expect learners starting this course to have previously studied ICT.

Guided learning hours

We design Cambridge IGCSE syllabuses based on learners having about 130 guided learning hours for each subject during the course but this is for guidance only. The number of hours a learner needs to achieve the qualification may vary according to local practice and their previous experience of the subject.

Availability and timetables

All Cambridge schools are allocated to one of six administrative zones. Each zone has a specific timetable.

You can view the timetable for your administrative zone at www.cambridgeinternational.org/timetables

You can enter candidates in the June and November exam series. If your school is in India, you can also enter your candidates in the March exam series.

Check you are using the syllabus for the year the candidate is taking the exam.

Private candidates can enter for this syllabus. For more information, please refer to the *Cambridge Guide to Making Entries*.

Combining with other syllabuses

Candidates can take this syllabus alongside other Cambridge International syllabuses in a single exam series. The only exceptions are:

- Cambridge IGCSE (9–1) Information and Communication Technology (0983)
- syllabuses with the same title at the same level.

Cambridge IGCSE, Cambridge IGCSE (9–1) and Cambridge O Level syllabuses are at the same level.

Group awards: Cambridge ICE

Cambridge ICE (International Certificate of Education) is a group award for Cambridge IGCSE. It allows schools to offer a broad and balanced curriculum by recognising the achievements of learners who pass exams in a range of different subjects.

Learn more about Cambridge ICE at www.cambridgeinternational.org/cambridgeice

Making entries

Exams officers are responsible for submitting entries to Cambridge International. We encourage them to work closely with you to make sure they enter the right number of candidates for the right combination of syllabus components. Entry option codes and instructions for submitting entries are in the *Cambridge Guide to Making Entries*. Your exams officer has a copy of this guide.

Exam administration

To keep our exams secure, we produce question papers for different areas of the world, known as administrative zones. We allocate all Cambridge schools to one administrative zone determined by their location. Each zone has a specific timetable. Some of our syllabuses offer candidates different assessment options. An entry option code is used to identify the components the candidate will take relevant to the administrative zone and the available assessment options.

Support for exams officers

We know how important exams officers are to the successful running of exams. We provide them with the support they need to make your entries on time. Your exams officer will find this support, and guidance for all other phases of the Cambridge Exams Cycle, at www.cambridgeinternational.org/eoguide

Retakes

Candidates can retake the whole qualification as many times as they want to. Information on retake entries is at www.cambridgeinternational.org/entries

Equality and inclusion

We have taken great care to avoid bias of any kind in the preparation of this syllabus and related assessment materials. In our effort to comply with the UK Equality Act (2010) we have taken all reasonable steps to avoid any direct and indirect discrimination.

The standard assessment arrangements may present barriers for candidates with impairments. Where a candidate is eligible, we may be able to make arrangements to enable that candidate to access assessments and receive recognition of their attainment. We do not agree access arrangements if they give candidates an unfair advantage over others or if they compromise the standards being assessed.

Candidates who cannot access the assessment of any component may be able to receive an award based on the parts of the assessment they have completed.

Information on access arrangements is in the *Cambridge Handbook* at www.cambridgeinternational.org/eoguide

Language

This syllabus and the related assessment materials are available in English only.

After the exam

Grading and reporting

Grades A*, A, B, C, D, E, F or G indicate the standard a candidate achieved at Cambridge IGCSE.

A* is the highest and G is the lowest. 'Ungraded' means that the candidate's performance did not meet the standard required for grade G. 'Ungraded' is reported on the statement of results but not on the certificate.

In specific circumstances your candidates may see one of the following letters on their statement of results:

- Q (PENDING)
- X (NO RESULT).

These letters do not appear on the certificate.

On the statement of results and certificates, Cambridge IGCSE is shown as INTERNATIONAL GENERAL CERTIFICATE OF SECONDARY EDUCATION (IGCSE).

How students and teachers can use the grades

Assessment at Cambridge IGCSE has two purposes:

- to measure learning and achievement

The assessment:

- confirms achievement and performance in relation to the knowledge, understanding and skills specified in the syllabus, to the levels described in the grade descriptions.

- to show likely future success

The outcomes:

- help predict which students are well prepared for a particular course or career and/or which students are more likely to be successful
- help students choose the most suitable course or career.

Grade descriptions

Grade descriptions are provided to give an indication of the standards of achievement candidates awarded particular grades are likely to show. Weakness in one aspect of the examination may be balanced by a better performance in some other aspect.

Grade descriptions for Cambridge IGCSE Information and Communication Technology will be published after the first assessment of the syllabus in 2023. Find more information at www.cambridgeinternational.org/0417

Changes to this syllabus for 2023, 2024 and 2025

The syllabus has been reviewed and revised for first examination in 2023.

This syllabus is version 1, published September 2020.

You must read the whole syllabus before planning your teaching programme.

Changes to syllabus content

- The learner attributes have been updated.
- The subject content has been moved to a two column format. The format change has allowed us to restructure the subject content and include notes and guidance designed to help teachers understand the scope of the topics.
- Most topic headings remain the same except Data manipulation has changed to Databases, and Data Analysis has changed to Spreadsheets.
- Some subtopics and learning outcomes have been added or removed, but the teaching time still falls within the recommended guided learning hours.
- The wording in the learning outcomes has been updated to provide clarity to what depth each topic should be taught and better support progression between IGCSE, AS Level and A Level.
- A list of command words used in the assessment for this syllabus has been included.

Changes to assessment (including changes to specimen papers)

- The syllabus aims have been revised to reflect the updated subject content.
- The titles of Paper 2 and Paper 3 have been changed to reflect the changes to the subject content.
- The number of marks for the theory and practical papers has been reduced and the duration of these papers has been reduced.

In addition to reading the syllabus, you should refer to the updated specimen assessment materials. The specimen papers will help your students become familiar with exam requirements and command words in questions. The specimen mark schemes explain how students should answer questions to meet the assessment objectives.

Any textbooks endorsed to support the syllabus for examination from 2023 are suitable for use with this syllabus.



'While studying Cambridge IGCSE and Cambridge International A Levels, students broaden their horizons through a global perspective and develop a lasting passion for learning.'

Zhai Xiaoning, Deputy Principal, The High School Affiliated to Renmin University of China

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