Syllabus

Cambridge IGCSE™
Information and Communication Technology 0417

Use this syllabus for exams in 2026, 2027 and 2028. Exams are available in the June and November series. Exams are also available in the March series in India.
**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.

Our Cambridge Pathway gives students a clear path for educational success from age 5 to 19. Schools can shape the curriculum around how they want students to learn – with a wide range of subjects and flexible ways to offer them. It helps students discover new abilities and a wider world, and gives them the skills they need for life, so they can achieve at school, university and work.

Our programmes and qualifications set the global standard for international education. They are created by subject experts, are rooted in academic rigour and reflect the latest educational research. They provide a strong platform for learners to progress from one stage to the next, and are well supported by teaching and learning resources. Learn more about our research at [www.cambridgeassessment.org.uk/our-research/](http://www.cambridgeassessment.org.uk/our-research/)

We believe education works best when curriculum, teaching, learning and assessment are closely aligned. Our programmes develop deep knowledge, conceptual understanding and higher-order thinking skills, to prepare students for their future. Together with schools, we develop Cambridge learners who are confident, responsible, reflective, innovative and engaged – equipped for success in the modern world.

Every year, nearly a million Cambridge students from 10,000 schools in 160 countries prepare for their future with the Cambridge Pathway.

**School feedback:** ‘We think the Cambridge curriculum is superb preparation for university.’

**Feedback from:** Christoph Guttentag, Dean of Undergraduate Admissions, Duke University, USA

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**Quality management**

Cambridge International is committed to providing exceptional quality. In line with this commitment, our quality management system for the provision of international education programmes and qualifications for students aged 5 to 19 is independently certified as meeting the internationally recognised standard, ISO 9001:2015. Learn more at [www.cambridgeinternational.org/about-us/our-standards/](http://www.cambridgeinternational.org/about-us/our-standards/)
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 5000 schools in 150 countries.

Our programmes promote 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.

School feedback: ‘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.’

Feedback from: Gary Tan, Head of Schools and CEO, Raffles 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. Cambridge students can be confident that their qualifications will be understood and valued throughout their education and career, in their home country and internationally. Many universities require a combination of Cambridge International AS & A Levels and Cambridge IGCSEs or equivalent to meet their entry requirements.

UK ENIC, 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 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

School feedback: ‘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.’

Feedback from: Managing Director of British School of Egypt BSE
Supporting teachers

We believe education is most effective when curriculum, teaching and learning, and assessment are closely aligned. We provide a wide range of resources, detailed guidance, innovative training and targeted 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.

Find out more at www.cambridgeinternational.org/support

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<th>Learning and revision</th>
<th>Results</th>
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<td>• Syllabuses</td>
<td>• Endorsed resources</td>
<td>• Example candidate responses</td>
<td>• Candidate Results Service</td>
</tr>
<tr>
<td>• Schemes of work</td>
<td>• Online forums</td>
<td>• Past papers and mark schemes</td>
<td>• Principal examiner reports for teachers</td>
</tr>
<tr>
<td>• Specimen Question Papers and Mark Schemes</td>
<td></td>
<td>• Learner guides</td>
<td>• Results Analysis</td>
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<td>• Teacher guides</td>
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<tr>
<td>• Next step guides</td>
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</table>

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

Syllabuses and specimen materials represent the final authority on the content and structure of all of our assessments.

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• Enrichment Professional Development – Transform your approach to teaching with our Enrichment workshops.
• Cambridge Professional Development Qualifications (PDQs) – Practice-based programmes that transform professional learning for practising teachers. Available at Certificate and Diploma level.

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We provide comprehensive support and guidance for all Cambridge exams officers.
Find out more at: www.cambridgeinternational.org/eoguide
# 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.
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 components. Candidates will be eligible for grades A* to G.

<table>
<thead>
<tr>
<th>All candidates take:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paper 1</strong></td>
</tr>
<tr>
<td>Theory</td>
</tr>
<tr>
<td>1 hour 30 minutes</td>
</tr>
<tr>
<td>80 marks</td>
</tr>
<tr>
<td>Questions will be based on sections 1–21 of the subject content</td>
</tr>
<tr>
<td>All questions are compulsory</td>
</tr>
<tr>
<td>Externally assessed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>and:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paper 2</strong></td>
</tr>
<tr>
<td>Document Production, Databases and Presentations</td>
</tr>
<tr>
<td>2 hours 15 minutes</td>
</tr>
<tr>
<td>70 marks</td>
</tr>
<tr>
<td>This test assesses the practical skills needed to use the applications covered in sections 17, 18 and 19</td>
</tr>
<tr>
<td>of the subject content</td>
</tr>
<tr>
<td>Candidates must demonstrate the practical skills relevant to sections 11–16</td>
</tr>
<tr>
<td>All tasks are compulsory</td>
</tr>
<tr>
<td>Externally assessed</td>
</tr>
</tbody>
</table>

| Component 3                                                                                               |
| Spreadsheets and Website Authoring                                                                        |
| 2 hours 15 minutes                                                                                         |
| 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.

Check the timetable at [www.cambridgeinternational.org/timetables](http://www.cambridgeinternational.org/timetables) for the test date window for Components 2 and 3.
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

<table>
<thead>
<tr>
<th>Assessment objective</th>
<th>Weighting in IGCSE %</th>
</tr>
</thead>
<tbody>
<tr>
<td>AO1 Recall, select and communicate knowledge and understanding of ICT</td>
<td>00</td>
</tr>
<tr>
<td>AO2 Apply knowledge, understanding and skills to produce ICT-based solutions</td>
<td>00</td>
</tr>
<tr>
<td>AO3 Analyse, evaluate, make reasoned judgements and present conclusions</td>
<td>00</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Assessment objectives as a percentage of each component

<table>
<thead>
<tr>
<th>Assessment objective</th>
<th>Weighting in components %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paper 1</td>
</tr>
<tr>
<td>AO1 Recall, select and communicate knowledge and understanding of ICT</td>
<td>80</td>
</tr>
<tr>
<td>AO2 Apply knowledge, understanding and skills to produce ICT-based solutions</td>
<td>0</td>
</tr>
<tr>
<td>AO3 Analyse, evaluate, make reasoned judgements and present conclusions</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>
# 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

<table>
<thead>
<tr>
<th>Candidates should know and understand: Hardware</th>
<th>Notes and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware</strong></td>
<td>Hardware consists of the physical components of a computer system</td>
</tr>
<tr>
<td></td>
<td>Internal components including Central Processing Unit (CPU), processor, motherboard</td>
</tr>
<tr>
<td></td>
<td>Internal memory including random access memory (RAM), read-only memory (ROM)</td>
</tr>
<tr>
<td></td>
<td>Hardware components including graphics card, sound card, Network Interface Card (NIC), camera, internal/external storage devices, input and output devices</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Software</strong></th>
<th>Software are programs for controlling the operation of a computer or processing of electronic data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Applications software provides the services that the user requires to solve a task</td>
</tr>
<tr>
<td></td>
<td>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)</td>
</tr>
<tr>
<td></td>
<td>System software provides the services that the computer requires to operate</td>
</tr>
<tr>
<td></td>
<td>Examples of system software including compilers, linkers, device drivers, operating systems and utilities</td>
</tr>
</tbody>
</table>

### Analogue and digital data

<table>
<thead>
<tr>
<th><strong>Analogue and digital data</strong></th>
<th>Characteristics of analogue and digital data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Differences between analogue and digital data</td>
</tr>
<tr>
<td></td>
<td>The need to convert:</td>
</tr>
<tr>
<td></td>
<td>• analogue to digital data so it can be processed by a computer</td>
</tr>
<tr>
<td></td>
<td>• digital data to analogue data so it can be used to control devices</td>
</tr>
</tbody>
</table>
### 1.2 The main components of computer systems

<table>
<thead>
<tr>
<th>Candidates should know and understand:</th>
<th>Notes and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Processing Unit (CPU)</td>
<td>The role of the CPU in processing instructions entered into the computer in order to produce an output</td>
</tr>
<tr>
<td>Internal memory</td>
<td>Characteristics of ROM and RAM</td>
</tr>
<tr>
<td></td>
<td>Differences between ROM and RAM</td>
</tr>
<tr>
<td>Input and output devices</td>
<td>Characteristics of input and output devices</td>
</tr>
<tr>
<td></td>
<td>Differences between input and output devices</td>
</tr>
<tr>
<td>Backing storage</td>
<td>Characteristics of backing storage</td>
</tr>
<tr>
<td></td>
<td>Differences between backing storage and internal memory</td>
</tr>
</tbody>
</table>

### 1.3 Operating systems

<table>
<thead>
<tr>
<th>Candidates should know and understand:</th>
<th>Notes and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating systems</td>
<td>Characteristics of operating systems including:</td>
</tr>
<tr>
<td></td>
<td>Command Line Interface (CLI), Graphical User Interface (GUI), dialogue based and gesture based interface</td>
</tr>
<tr>
<td></td>
<td>Differences between types of operating systems</td>
</tr>
<tr>
<td></td>
<td>Advantages and disadvantages of the different types of operating systems</td>
</tr>
</tbody>
</table>

### 1.4 Types of computer

<table>
<thead>
<tr>
<th>Candidates should know and understand:</th>
<th>Notes and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop computer</td>
<td>Characteristics of a desktop computer</td>
</tr>
<tr>
<td></td>
<td>Uses of a desktop computer including office and business management, education, gaming and entertainment</td>
</tr>
<tr>
<td>Mobile computers</td>
<td>Characteristics of mobile computers including laptop computers, smartphones, tablet and phablet computers</td>
</tr>
<tr>
<td></td>
<td>Uses of mobile computers including office and business management, education, gaming, entertainment and remotely controlled devices</td>
</tr>
<tr>
<td></td>
<td>Advantages and disadvantages of the different types of computer including portability and expandability</td>
</tr>
</tbody>
</table>
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), barcode 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

Notes and Guidance
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

Notes and Guidance
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

Notes and Guidance
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
- 3D printers

**Notes and Guidance**
- Characteristics and uses of patient records, pharmacy records
- 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:

**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:

**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:

**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

Notes and Guidance

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

Notes and Guidance

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
- 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
8.3 Security of data continued

Candidates should know and understand:
Protection of data

Notes and Guidance
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**

<table>
<thead>
<tr>
<th>Notes and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Characteristics and effects of spam email including the methods which can be used to help prevent spam</td>
</tr>
</tbody>
</table>

### 10.2 Effective use of the internet

Candidates should know and understand:
- **The internet**

<table>
<thead>
<tr>
<th>Notes and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Functionality including Internet Service Provider (ISP), structure of a web address, Uniform Resource Locator (URL), hyperlink, web browser.</td>
</tr>
<tr>
<td>Use of search engine including speed of searching, amount of information, the speed of finding relevant information, ease of finding reliable information.</td>
</tr>
<tr>
<td>Evaluating the information found on the internet including how up to date, reliable, biased and valid this information is.</td>
</tr>
<tr>
<td>Internet protocols including HyperText Transfer Protocol (HTTP), HyperText Transfer Protocol secure variant (HTTPS), File Transfer Protocol (FTP), Secure Socket Layer (SSL).</td>
</tr>
<tr>
<td>Risks of using the internet including inappropriate and criminal material, restricting data through parental, educational and ISP control.</td>
</tr>
</tbody>
</table>
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)
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

<table>
<thead>
<tr>
<th>Candidates should be able to:</th>
<th>Notes and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create an appropriate database structure</td>
<td>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.</td>
</tr>
<tr>
<td>Create and use a data entry form</td>
<td>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.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Candidates should be able to:</th>
<th>Notes and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform calculations</td>
<td>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.</td>
</tr>
<tr>
<td>Sort data</td>
<td>Use a single criterion, or multiple criteria to sort data into ascending or descending order.</td>
</tr>
<tr>
<td>Search and select data</td>
<td>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, &gt;, =, &gt;=, &lt;=, &lt;&gt; perform searches using wildcards.</td>
</tr>
</tbody>
</table>
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**
  - Notes and Guidance: Using a single criterion, or multiple criteria, select subsets of data. Perform searches using a variety of operators including AND, OR, NOT, >, <, =, >=, <=, <>.

## 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**
  - Notes and Guidance: 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**
  - Notes and Guidance: 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

<table>
<thead>
<tr>
<th>Notes and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create the content layer of a web page</td>
</tr>
<tr>
<td>Place appropriate elements in the head section of a web page including:</td>
</tr>
<tr>
<td>- insert a page title to display in the browser</td>
</tr>
<tr>
<td>- attach external stylesheets (with the correct hierarchy, using a relative file path)</td>
</tr>
<tr>
<td>- metatags to use the appropriate attributes including to define the charset, name attributes (description, keywords, author, viewport), content attributes</td>
</tr>
<tr>
<td>- default target windows</td>
</tr>
<tr>
<td>Place appropriate content in the body section of a web page</td>
</tr>
<tr>
<td>Insert a table including table header, table rows, table data</td>
</tr>
<tr>
<td>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</td>
</tr>
<tr>
<td>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</td>
</tr>
<tr>
<td>Use the <code>&lt;div&gt;</code> tag including to apply styles and classes</td>
</tr>
<tr>
<td>Apply tags to text within a web page to display pre-defined styles including h1, h2, h3, p, li</td>
</tr>
<tr>
<td>Apply classes to elements within a web page</td>
</tr>
<tr>
<td>Apply styles to elements within a web page including to a list (ordered list, unordered list)</td>
</tr>
<tr>
<td>Create a bookmark within a web page using an id attribute</td>
</tr>
<tr>
<td>Create hyperlinks from text and images to:</td>
</tr>
<tr>
<td>- bookmarks on the same page</td>
</tr>
<tr>
<td>- other locally stored web pages</td>
</tr>
<tr>
<td>- a website using the URL</td>
</tr>
<tr>
<td>- send mail to a specified email address</td>
</tr>
<tr>
<td>- to open in a specified location (the same window, a new window, with a window named as specified)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Candidates should know and understand:</th>
<th>Notes and Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>The use of CSS in the presentation layer</td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>Characteristics of a style and a class including the difference between them</td>
</tr>
<tr>
<td></td>
<td>Reason relative file paths must be used for attached stylesheets</td>
</tr>
</tbody>
</table>
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

Any hardware platform, operating system and applications packages can be used by candidates in the practical tests, 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.

<table>
<thead>
<tr>
<th>Command word</th>
<th>What it means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyse</td>
<td>examine in detail to show meaning, identify elements and the relationship between them</td>
</tr>
<tr>
<td>Compare</td>
<td>identify/comment on similarities and/or differences</td>
</tr>
<tr>
<td>Contrast</td>
<td>identify/comment on differences</td>
</tr>
<tr>
<td>Define</td>
<td>give precise meaning</td>
</tr>
<tr>
<td>Demonstrate</td>
<td>show how or give an example</td>
</tr>
<tr>
<td>Describe</td>
<td>state the points of a topic / give characteristics and main features</td>
</tr>
<tr>
<td>Discuss</td>
<td>write about issue(s) or topic(s) in depth in a structured way</td>
</tr>
<tr>
<td>Evaluate</td>
<td>judge or calculate the quality, importance, amount, or value of something</td>
</tr>
<tr>
<td>Explain</td>
<td>set out purposes or reasons / make the relationships between things clear / say why and/or how and support with relevant evidence</td>
</tr>
<tr>
<td>Give</td>
<td>produce an answer from a given source or recall/memory</td>
</tr>
<tr>
<td>Identify</td>
<td>name/select/recognise</td>
</tr>
<tr>
<td>Justify</td>
<td>support a case with evidence/argument</td>
</tr>
<tr>
<td>State</td>
<td>express in clear terms</td>
</tr>
<tr>
<td>Suggest</td>
<td>apply knowledge and understanding to situations where there are a range of valid responses in order to make proposals / put forward considerations</td>
</tr>
</tbody>
</table>
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 recommend that learners starting this course should have studied a broad curriculum such as the Cambridge Lower Secondary programme or equivalent national educational framework.

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

Guided learning hours

We design Cambridge IGCSE syllabuses to require about 130 guided learning hours for each subject. This is for guidance only. The number of hours a learner needs to achieve the qualification may vary according to each school and the learners’ 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. Find your administrative zone at www.cambridginternational.org/adminzone

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 encourages 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 access to 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 an 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 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/retakes

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

Accessibility and equality
Syllabus and assessment design
At Cambridge International, we work to avoid direct or indirect discrimination in our syllabuses and assessment materials. We aim to maximise inclusivity for candidates of all national, cultural or social backgrounds and candidates with protected characteristics, which include special educational needs and disability, religion and belief, and characteristics related to gender and identity. We also aim to make our materials as accessible as possible by using accessible language and applying accessible design principles. This gives all candidates the fairest possible opportunity to demonstrate their knowledge, skills and understanding and helps to minimise the requirement to make reasonable adjustments during the assessment process.
Access arrangements

Access arrangements (including modified papers) are the principal way in which Cambridge International complies with our duty, as guided by the UK Equality Act (2010), to make ‘reasonable adjustments’ for candidates with special educational needs (SEN), disability, illness or injury. Where a candidate would otherwise be at a substantial disadvantage in comparison to a candidate with no SEN, disability, illness or injury, we may be able to agree pre-examination access arrangements. These arrangements help a candidate by minimising accessibility barriers and maximising their opportunity to demonstrate their knowledge, skills and understanding in an assessment.

Important:
Requested access arrangements should be based on evidence of the candidate's barrier to assessment and should also reflect their normal way of working at school. This is explained in the Cambridge Handbook www.cambridgeinternational.org/eoguide

- For Cambridge International to approve an access arrangement, we will need to agree that it constitutes a reasonable adjustment, involves reasonable cost and timeframe and does not affect the security and integrity of the assessment.
- Availability of access arrangements should be checked by centres at the start of the course. Details of our standard access arrangements and modified question papers are available in the Cambridge Handbook www.cambridgeinternational.org/eoguide
- Please contact us at the start of the course to find out if we are able to approve an arrangement that is not included in the list of standard access arrangements.
- Candidates who cannot access parts of the assessment may be able to receive an award based on the parts they have completed.

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:

1. to measure learning and achievement
   The assessment confirms achievement and performance in relation to the knowledge, understanding and skills specified in the syllabus.

2. 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.
   The outcomes help students choose the most suitable course or career.
Changes to this syllabus for 2026, 2027 and 2028

The syllabus has been updated. This is version 1, published September 2023.

There are no significant changes which affect teaching.

You must read the whole syllabus before planning your teaching programme. We review our syllabuses regularly to make sure they continue to meet the needs of our schools. In updating this syllabus, we have made it easier for teachers and students to understand, keeping the familiar features that teachers and schools value.

Any textbooks endorsed to support the syllabus for examination from 2023 are still suitable for use with this syllabus.
School feedback: ‘While studying Cambridge IGCSE and Cambridge International A Levels, students broaden their horizons through a global perspective and develop a lasting passion for learning.’

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