CAMBRIDGE
International Education

Syllabus

Cambridge O Level Design & Technology 6043 for centres in Mauritius

Use this syllabus for exams in 2028, 2029 and 2030.
Exams are available in the November series.

Version 1

For the purposes of screen readers, any mention in this document of Cambridge IGCSE refers to Cambridge International General Certificate of Secondary Education.

Cambridge Pathway

Why choose Cambridge?

We work with schools worldwide to build an education that shapes knowledge, understanding and skills. Together, we give learners the confidence they need to thrive and make a positive impact in a changing world.

As part of the University of Cambridge, we offer a globally trusted and flexible framework for education from age 3 to 19, informed by research, experience, and listening to educators.

With recognised qualifications, high-quality resources, comprehensive support and valuable insights, we help schools prepare every student for the opportunities and challenges ahead.

Qualifications that are recognised and valued worldwide

From the world's top-ranked universities to local higher education institutions, Cambridge qualifications open doors to a world of opportunities.

Setting a global standard

With over 160 years of experience in delivering fair, valid and reliable assessments to students worldwide, we offer a global, recognised performance standard for international education.

Your path, your way

Schools can adapt our curriculum, high-quality teaching and learning resources and flexible assessments to their local context. Our aligned offer helps Cambridge schools support every learner to reach their potential and thrive.

Learning with lasting impact

Cambridge learners build subject knowledge and conceptual understanding, and develop a broad range of skills, learning habits and attributes to help make them ready for the world.

Improving learning outcomes through data-led insight and action

Our trusted baseline and diagnostic assessments, together with our insights and evaluation service, help schools turn data into knowledge and actionable insights, to inform teaching decisions and improve learner outcomes.

Bringing together a community of experts

We bring together the collective knowledge of experts and our diverse community of educators worldwide, supporting them to learn from one another and share ideas and information.

Tackling the climate crisis together

We believe that education is key to tackling the climate crisis. Together with Cambridge schools, we can empower young people with the skills and knowledge to take action on climate change, helping them be ready for the world.

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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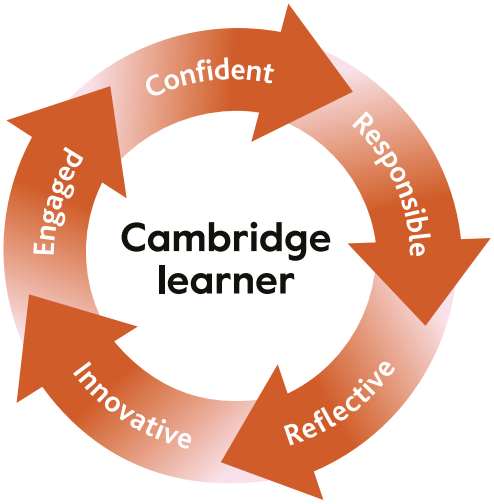
Important: Changes to this syllabus

For information about changes to this syllabus for 2028, 2029 and 2030, go to page 49.

1 Why choose this syllabus?

Key benefits



Cambridge O Level is typically for 14 to 16 year olds and is an internationally recognised qualification. It has been designed especially for an international market and is sensitive to the needs of different countries. Cambridge O Level is designed for learners whose first language may not be English, and this is acknowledged throughout the examination process.

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 O Level Design & Technology provides opportunities for learners to develop their creative thinking, problem solving and practical skills. They learn to identify and solve design problems by working with different materials, technologies, tools and equipment, and develop the communication skills central to the design process.

The syllabus is designed to suit a wide range of interests, materials and resources and allows teaching staff to use their different skills.

The syllabus provides a sound basis for further study and equips learners with technical knowledge and practical designing and making skills for real world application.

Our approach in Cambridge O Level Design & Technology encourages learners to be:

confident, identifying design needs and applying technical knowledge and understanding to develop and communicate design proposals

responsible, in using resources for designing and making, and understanding the impact their use has on the wider world

reflective, evaluating their work as they review, refine and adapt design proposals

innovative, combining technical knowledge and understanding with creative thinking to solve design problems in new ways

engaged, designing with empathy for the user and awareness of the relationship between design, society and the environment.

School feedback: 'Cambridge O Level has helped me develop thinking and analytical skills which will go a long way in helping me with advanced studies.'

Feedback from: Kamal Khan Virk, former student at Beaconhouse Garden Town Secondary School, Pakistan, who went on to study Actuarial Science at the London School of Economics

Qualifications that are recognised and valued worldwide

Cambridge qualifications prepare and equip learners with the skills they need to thrive at university and beyond. The world's best higher education institutions recognise our qualifications and value the critical thinking skills, independent research abilities and deep subject knowledge that Cambridge learners bring.

We continually work with universities and colleges in every part of the world to ensure that they understand and accept our qualifications. Cambridge O Level provides a springboard to the Cambridge Advanced stage, as well as other post-16 routes. The combination of knowledge and skills in Cambridge O Level Design & 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 Design & Technology.

Many universities require a combination of Cambridge International AS & A Levels and Cambridge O Levels or equivalent to meet their entry requirements.

Learn more at **www.cambridgeinternational.org/recognition**

Supporting teachers

We believe education works best when teaching and learning are closely aligned to the curriculum, resources and assessment. Our high-quality teaching support helps to maximise teaching time and enables teachers to engage learners of all backgrounds and abilities.

We aim to provide the following support for each Cambridge qualification:

- Syllabus
- Specimen question papers and mark schemes
- Specimen paper answers
- Schemes of Work
- Example candidate responses
- Past papers and mark schemes
- Principal examiner reports for teachers

These resources are available on the School Support Hub at **www.cambridgeinternational.org/support**, our secure online site for Cambridge teachers (user name and password required). If you do not have access, speak to the School Support coordinator at your school.

This O Level syllabus shares content with other Design & Technology syllabuses. Go to **www.cambridgeinternational.org/support** (user name and password required) for IGCSE™ Design & Technology. If you do not have access, speak to the School Support coordinator at your school.

Endorsed resources

We work with a range of publishers to provide a choice of high-quality resources to help teachers plan and deliver Cambridge programmes and qualifications. All Cambridge endorsed resources have been through a detailed quality assurance process to make sure they closely reflect the syllabus and provide a high level of support for teachers and learners. Textbooks endorsed to support IGCSE Design & Technology are suitable for use with this syllabus.

Training

We offer a range of support activities for teachers to ensure they have the relevant knowledge and skills to deliver our qualifications.

2 Syllabus overview

Aims

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

You can deliver some of the aims using suitable local materials and design contexts.

Students following a course based on this syllabus will:

- develop creative thinking and practical skills in design and technology, building confidence to tackle real world challenges
- apply problem-solving skills to a range of design challenges, to think critically and innovate
- develop communication skills essential for bringing design ideas to life and evaluating their impact
- gain knowledge and understanding of materials, processes and systems
- develop skills in research, investigation, analysis and evaluation
- design and make products considering user needs, sustainability, and their wider impact on society
- develop the ability to make aesthetic and technical value judgements
- build a secure base for future studies and careers in design and technology, setting the foundations for continued success.

We are 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

Candidates study the Common content and either the Materials option or the Graphic products option.

Candidates apply their content and skills in a practical context in the Component 2 project.

- Common content
  - Influences on designing
  - Designing principles
  - Communicating designs
  - Making principles
  - Material classification
  - Structures
  - Mechanisms
  - Electronics

- Materials option
  - Types of material
  - Making processes
  - Commercial manufacturing methods
  - Product analysis
  - Use of technology

- Graphic products option
  - Types of material
  - Drawing techniques
  - Making processes
  - Product analysis
  - Use of technology

Assessment overview

All candidates take three components. Candidates take Paper 1 and Component 2 and **either** Paper 3 **or** Paper 4. Candidates will be eligible for grades A* to E.

All candidates take:

Paper 1 1 hour
Product Design 25%

50 marks

- Candidates answer **all** questions
- Questions are based on the Common content
- Written paper

Externally assessed

and:

Component 2
Project 50%

100 marks

- School-based assessment

Internally assessed and externally moderated

All candidates take either:

Paper 3 1 hour
Materials 25%

50 marks

- Candidates answer **all** questions
- Questions are based on the specialist option: Materials
- Written paper

Externally assessed

or:

Paper 4 1 hour
Graphic Products 25%

50 marks

- Candidates answer **all** questions
- Questions are based on the specialist option: Graphics products
- Drawing paper

Externally assessed

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

Check the samples database at **www.cambridgeinternational.org/samples** for submission information, forms and deadlines for Component 2.

Assessment objectives

The assessment objectives (AOs) are:

AO1 Knowledge and understanding

Candidates should be able to demonstrate knowledge and understanding of:

- iterative design principles
- a range of materials, processes, tools and equipment used in design and technology
- methods of communication used in design and technology
- the interaction between design and society.

AO2 Application and design communication

Candidates should be able to:

- apply knowledge and understanding to a variety of design problems
- use research skills to develop a design brief and design specification
- use different design strategies to generate design proposals
- apply design communication skills to explore and communicate ideas.

AO3 Development and realisation

Candidates should be able to:

- use modelling to make and test design proposals
- develop design proposals, taking responsible design into consideration
- develop design solutions, using working knowledge of materials
- realise design solutions, using appropriate materials and practical processes
- use safe working practices when making models and products.

AO4 Analysis and evaluation

Candidates should be able to:

- analyse, test and evaluate products made by themselves and others
- identify and propose how to improve or modify products
- analyse and evaluate the needs of the user in relation to the design problem and justify design decisions
- assess the impact of design and products in relation to design responsibility.

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 O Level %**
AO1 Knowledge and understanding	25
AO2 Application and design communication	35
AO3 Development and realisation	20
AO4 Analysis and evaluation	20
Total	100

Assessment objectives as a percentage of each component

Assessment objective	**Weighting in components %**			
	Paper 1	**Paper 2**	**Paper 3**	**Paper 4**
AO1 Knowledge and understanding	40	0	60	60
AO2 Application and design communication	40	40	20	20
AO3 Development and realisation	0	40	0	0
AO4 Analysis and evaluation	20	20	20	20
Total	100	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 contexts and materials 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.

Where 'including' is used in the syllabus subject content, candidates must study everything in the list. There may be other relevant examples you may choose to study with your students.

Where 'for example' is used in the syllabus subject content, candidates may study the given examples but they are not compulsory and other examples may be selected, particularly if these other examples are more appropriate to the learning context.

1 Common content

1.1 Influences on designing

Candidates should develop designs that fully consider:

- user needs
- where the product will be used
- anthropometrics and ergonomics
- aesthetics
- safety
- inclusivity
- sustainability (including energy sources and Rethink, Refuse, Reduce, Reuse, Repair and Recycle)
- existing designs
- fashion and trends
- society and different cultures
- legal requirements
- the availability of materials and technologies
- the impact of design on society and markets.

1.2 Designing principles

The designing principles are presented in a linear format for clarity. This does not mean that candidates should follow a linear approach to their design work.

1.2.1 Identifying

Candidates should be able to:

- identify needs, wants and opportunities for designing and making through such methods as observation, interviews, analysis of products and data
- describe needs and opportunities for designing and making.

continued

1.2 **Designing principles** continued

1.2.2 Defining

Candidates should be able to:

- identify and respond to the constraints created by knowledge, resource availability and/or external sources which may influence proposed designs
- collect and organise research information relevant to the solution of design problems
- interpret and present data (e.g. diagrams, flowcharts, graphs, experimental and test results)
- analyse data and research to produce specifications for design problems which they, or others, have identified.

1.2.3 Proposing

Candidates should be able to:

- sketch and annotate a range of distinct, imaginative and innovative designs
- evaluate and explore each design, with reference to the specification, to determine a proposed solution.

1.2.4 Developing

Candidates should be able to:

- explore technical and functional aspects of the proposed solution through physical and/or virtual modelling
- communicate the main features/aspects of the proposed solution
- specify details of form, materials and construction/production methods
- consider product life cycle in the design of their proposed solution
- evaluate the proposed solution with reference to the specification to determine fitness for purpose and if necessary, develop the proposed solution further.

1.2.5 Planning

Candidates should be able to:

- produce clear and accurate working drawings which include full details required to make the product
- produce a production plan which includes the stages of making
- specify and justify materials, components and finishes required to make the product
- show a knowledge of available stock forms, types and sizes of the classes of materials listed in section 1.5
- show awareness of social, ethical and environmental factors in planning for production.

1.2.6 Testing and evaluating

Candidates should be able to:

- understand the importance of testing and evaluating throughout the design process
- evaluate a product with reference to the specification, and its social, ethical and environmental impact throughout its life cycle
- make concluding comments about the successes and limitations of the design
- identify proposals for further development of a product.

1.3 Communicating designs

1.3.1 Drawing techniques

Candidates should be able to:

- use freehand sketching and annotations to communicate design ideas
- understand the use of orthographic, isometric, exploded drawings and developments (nets)
- understand the use of flowcharts, Gantt charts and materials lists in planning for making
- understand the use of computer-aided design (CAD) where appropriate.

1.3.2 Modelling

Candidates should be able to:

- understand the reasons for modelling
- understand different types of models including exploratory and prototype
- produce models and use them to draw conclusions that influence design development.

1.4 Making principles

1.4.1 Measuring and marking out

Candidates should be able to:

- show knowledge of accurately measuring and marking out using appropriate tools and equipment for the classes of materials listed in section 1.5.

1.4.2 Cutting, shaping and forming

Candidates should be able to:

- show knowledge of cutting, shaping and forming using appropriate tools and equipment for the classes of materials listed in section 1.5.

1.4.3 Joining

Candidates should be able to:

- show knowledge of temporary and permanent methods for joining the classes of materials listed in section 1.5.

1.4.4 Finishing

Candidates should be able to:

- show knowledge of a range of finishes for the classes of materials listed in section 1.5.

1.5 Material classification

Candidates should be able to:

- understand the classification, properties and working characteristics of the following materials:
  - papers and boards
  - hardwoods, softwoods and manufactured boards
  - ferrous and non-ferrous metals and alloys
  - thermo polymers and thermosetting polymers
  - composites and smart materials.

1.6 Structures

Candidates should be able to:

- understand the classification and characteristics of natural and manufactured, shell, frame and mass structures
- show knowledge of static and dynamic loads
- understand forces that act on structures:
  - tension
  - compression
  - shear
  - bending
  - torsion
- show knowledge of reinforcement methods used in structures:
  - triangulation
  - corrugation.

1.7 Mechanisms

Candidates should be able to:

- identify and sketch simple examples of first-, second- and third-class levers, and associated linkages
- show knowledge of gears, pulleys and belts, sprockets, and chain drives for practical applications
- recognise the need to reduce friction between two surfaces by design, and describe the types of lubrication
- recognise and give examples of the following types of motion:
  - rotary
  - linear
  - reciprocating
  - oscillating
- identify examples of the conversion of motion
- understand how mechanisms can be used to change direction or force of motion.

1.8 Electronics

Candidates should be able to:

- use correct symbols and conventions when drawing circuit diagrams
- show knowledge of common input, process and output components, including:
  - power sources
  - switches
  - movement components
  - light-emitting components
  - sound-emitting components
  - sensing components
  - transistors
- identify and show knowledge of open and closed loop systems
  - input, process, output and feedback
- understand the use of programmable integrated circuits
- show knowledge of building and testing of simple circuits through physical and/or virtual modelling.

2 Materials option

It is acknowledged that some centres taking the Materials option may have workshop facilities focused primarily on one type of material. Candidates are required to have knowledge of all types of material specified in section 2.1 with working knowledge and practical experience of at least one category.

2.1 Types of material

2.1.1 Polymers

Candidates should be able to:

- demonstrate knowledge of polymers, including biopolymers, and understand their classification, stock forms, properties, environmental impact and uses
- demonstrate knowledge of thermo polymers, for example:
  - nylon
  - low- and high-density polyethylene (LDPE and HDPE)
  - polyethylene terephthalate (PET)
  - polyvinyl chloride (PVC)
  - acrylic (PMMA)
  - polystyrene (PS)
  - polypropylene (PP)
  - acrylonitrile-butadiene-styrene (ABS)
  - polylactic acid (PLA)
- demonstrate working knowledge of the following thermosetting polymers:
  - polyester resin
  - epoxy resin.

continued

2.1 Types of material continued

2.1.2 Timbers and boards

Candidates should be able to:

- demonstrate knowledge of natural timbers and understand their classification, stock forms, properties, environmental impact and uses
- demonstrate knowledge of softwood timbers, for example:
  - cedar
  - pine
  - redwood
  - spruce
  - local equivalents
- demonstrate knowledge of hardwood timbers, for example:
  - oak
  - mahogany
  - meranti
  - jelutong
  - local equivalents
- demonstrate knowledge of manufactured boards, for example:
  - plywood
  - chipboard
  - fibre-based boards including medium density fibreboard (MDF)
  - local equivalents
- understand the advantages and disadvantages of working with manufactured boards compared with natural timbers.

2.1.3 Metals

Candidates should be able to:

- demonstrate knowledge of metals and understand their classification, stock forms, properties, environmental impact and uses
- demonstrate knowledge of ferrous metals and alloys, for example:
  - cast iron
  - mild steel
  - stainless steel
  - high-speed steel (HSS) and carbon steels
- demonstrate knowledge of non-ferrous metals and alloys, for example:
  - aluminium
  - copper
  - lead
  - tin
  - zinc
  - brass
  - duralumin
  - pewter
- understand how work hardening and heat treatments can affect the properties of metals by changing the molecular structure.

continued

2.1 Types of material continued

2.1.4 Composites

Candidates should be able to:

- demonstrate knowledge of composite materials and understand their classification, properties, environmental impact and uses
- show an understanding of the term composite and be aware of the practical applications for each of the following composite materials:
  - carbon fibre reinforced polymer (CFRP)
  - glass reinforced polymer (GRP)
  - melamine formaldehyde (MF).

2.1.5 Smart, modern and alternative materials

- develop an awareness and understanding of smart, modern and alternative materials, for example:
  - thermochromic materials
  - photochromic materials
  - hydrochromic materials
  - polymorph
  - shape memory alloys (SMA)
  - shape memory polymers (SMP)
  - biopolymers
  - bamboo
  - graphene
  - Kevlar®
  - metal foam.

2.2 Making processes

Candidates are not required to have knowledge of specific tools, equipment or components, but should be able to recommend appropriate tools, equipment and components for the processes listed.

2.2.1 Measuring and marking out

Candidates should be able to:

- measure and/or mark out, consistently and accurately, using appropriate hand tools and equipment, and/or CAD tools.

2.2.2 Cutting, shaping and forming

Candidates should be able to:

- select and perform methods of cutting and removal of materials, using appropriate hand tools, power tools, machinery and/or computer-aided manufacture (CAM).

continued

2.2 Making processes continued

2.2.3 Joining

Candidates should be able to:

- select and use appropriate methods of permanently or temporarily joining materials, for example:
  - joints
  - pre-manufactured components and fasteners
  - adhesives
  - heat processes.

2.2.4 Finishing

Candidates should be able to:

- select and use appropriate finishes for materials including:
  - decorative finishes
  - protective finishes
- show an understanding of self-finishing materials.

2.2.5 Safe working practices

Candidates should be able to:

- demonstrate safe use of hand tools, power tools, machinery and/or computer-aided manufacture (CAM) equipment
- select and use appropriate PPE (Personal Protective Equipment) when working practically.

2.3 Commercial manufacturing methods

Candidates should be able to:

- show knowledge of how products can be commercially manufactured from the materials named in 2.1, using:
  - forming processes (for example, injection moulding, steam bending, press forming)
  - casting processes (for example, resin casting, sand casting, die casting)
  - assembly aids (for example, jigs, fixtures)
  - automation (for example, robotics)
  - heat treatments.

2.4 Product analysis

Candidates should be able to:

- analyse real-world products made from the materials named in 2.1
- understand the main scales of production are:
  - prototype or one-off production
  - batch production
  - mass production
  - continuous production
- understand that quality assurance checks are used throughout manufacture to ensure a product meets the customers' expectations
- understand that products are:
  - designed
  - manufactured
  - used and maintained
  - disassembled and reused, recycled or disposed of at the end of their useful life
- understand that products may have a limited lifetime (planned obsolescence and unplanned obsolescence) and the impact on sustainability.

2.5 Use of technology

2.5.1 Communication

Candidates should be able to:

- understand the advantages and disadvantages of using text, emails and social media platforms in communicating design proposals
- understand the advantages and disadvantages of using collaborative and remote working software in communicating design proposals.

2.5.2 Designing

Candidates should be able to:

- understand the advantages and disadvantages of using computer-aided design (CAD) to design products
- understand the benefits and risks of using artificial intelligence (AI) in product design.

2.5.3 Making

Candidates should be able to:

- understand the advantages and disadvantages of using computer-aided manufacture (CAM) to make products.

3 Graphic products option

It is acknowledged that some centres taking the Graphic products option may have facilities focused primarily on one type of material. Candidates are required to have knowledge of all types of material specified in section 3.1 with working knowledge and practical experience of at least one category.

3.1 Types of material

3.1.1 Paper and card

Candidates should be able to:

- demonstrate knowledge of different types of paper and card and understand their properties, stock forms, environmental impact and uses
- demonstrate knowledge of the following materials:
  - papers
  - cards
  - boards
  - corrugated cards and boards.

3.1.2 Polymers

Candidates should be able to:

- demonstrate knowledge of polymers, including biopolymers, and understand their classification, stock forms, properties, environmental impact and uses
- demonstrate knowledge of thermo polymers, for example:
  - nylon
  - low- and high-density polyethylene (LDPE and HDPE)
  - polyethylene terephthalate (PET)
  - polyvinyl chloride (PVC) (including self-adhesive vinyl)
  - acrylic (PMMA)
  - polystyrene (PS)
  - polypropylene (PP)
  - acrylonitrile-butadiene-styrene (ABS)
  - polylactic acid (PLA)
- demonstrate knowledge of the following thermosetting polymers:
  - polyester resin
  - epoxy resin.

3.1.3 Foam materials

Candidates should be able to:

- demonstrate knowledge of foam materials and understand their classification, stock forms, properties, environmental impact and uses
- demonstrate knowledge of the following foam materials:
  - foamboard
  - Styrofoam.

continued

3.1 Types of material continued

3.1.4 Composites

Candidates should be able to:

- demonstrate knowledge of composite materials and understand their classification, properties, environmental impact and uses
- demonstrate knowledge of the following composite materials:
  - foil based composites
  - particle based composites.

3.1.5 Smart, modern and alternative materials

Candidates should:

- develop an awareness and understanding of smart, modern and alternative materials, for example:
  - thermochromic materials
  - photochromic materials
  - polymorph
  - biopolymers
  - shape memory polymer (SMP).

3.2 Drawing techniques

3.2.1 Technical drawing methods

Candidates should be able to:

- demonstrate a working knowledge of dimensioning and drawing to recommended scales and standards
- understand how the following drawing techniques can be used in designing and making:
  - geometrical constructions, including division of lines and angles: regular plane linear shapes (triangles, quadrilaterals, pentagons, hexagons and octagons), circles, tangents and tangential arcs, ellipses constructed by an accurate method (trammels will be permitted)
  - orthographic: first and third angle projection, use of scale and standard conventions, sectional views
  - three-dimensional (3D) drawing: isometric, planometric, one-point and two-point perspective, exploded views
  - assembly drawings: single drawing showing component parts, parts lists
  - developments (nets): 3D shapes and packages, temporary and permanent methods of joining developments (nets).

3.2.2 Methods of communicating information

Candidates should be able to:

- draw and interpret histograms, pie charts, bar charts and graphs from data provided, to represent numerical data and distributions
- draw flowcharts to describe processes, operations or assemblies.

continued

3.2 Drawing techniques continued

3.2.3 Presentation

Candidates should be able to:

- use shading, colouring and other techniques for emphasis (e.g. the thick and thin line technique)
- apply an understanding of light, shade and shadow to give increased visual impact to pictorial drawing
- communicate the material and surface finish of a given product by rendering drawings to look like wood, metal and polymer.

3.3 Making processes

Candidates are not required to have knowledge of specific tools, equipment or components, but should be able to recommend appropriate tools, equipment and components for the processes listed.

3.3.1 Measuring and marking out

Candidates should be able to:

- measure and/or mark out, consistently and accurately, using appropriate hand tools and equipment, and/or CAD tools.

3.3.2 Cutting, shaping and forming

Candidates should be able to:

- select and perform methods of cutting, shaping and forming of materials, using appropriate hand tools, power tools, machinery and/or computer-aided manufacture (CAM).

3.3.3 Joining

Candidates should be able to:

- select and use appropriate methods of permanently or temporarily joining materials, including:
  - adhesives
  - slots, arrow tabs and flaps
  - pre-manufactured components
  - fasteners.

3.3.4 Printing

Candidates should be able to:

- show knowledge of printing techniques used in the manufacture of graphic products.

3.3.5 Finishing

Candidates should be able to:

- select and use appropriate finishes including:
  - decorative finishes
  - protective finishes
- show an understanding of self-finishing materials.

3.3.6 Safe working practices

Candidates should be able to:

- demonstrate safe use of hand tools, power tools, machinery and/or computer-aided manufacture (CAM) equipment
- select and use appropriate PPE (Personal Protective Equipment) when working practically.

3.4 Product analysis

Candidates should be able to:

- analyse real-world products made from the materials listed in section 3.1
- understand the main scales of production are:
  - prototype or one-off production
  - batch production
  - mass production
  - continuous production
- understand that quality assurance checks are used throughout manufacture to ensure a product meets the customers' expectations
- understand that products are:
  - designed
  - manufactured
  - used and maintained
  - disassembled and reused, recycled or disposed of at the end of their useful life
- understand the concepts of planned and unplanned obsolescence and the impact on sustainability.

3.5 Use of technology

3.5.1 Communication

Candidates should be able to:

- understand the advantages and disadvantages of using text, emails and social media platforms in communicating design proposals
- understand the advantages and disadvantages of using collaborative and remote working software in communicating design proposals
- show knowledge of the use of digital tools and software in graphic design.

3.5.2 Designing

Candidates should be able to:

- understand the advantages and disadvantages of using computer-aided design (CAD) to design products
- understand the benefits and risks of using artificial intelligence (AI) in product design.

3.5.3 Making

Candidates should be able to:

- understand the advantages and disadvantages of using computer-aided manufacture (CAM) to make products.

Faculty feedback: 'Understanding how and why our climate is changing and providing the knowledge and skills to explore the challenges plays a key role in every student's education.'

Feedback from: Dr Amy Munro-Faure, Head of Education and Student Engagement of Cambridge Zero

4 Details of the assessment

Compulsory components

Paper 1 – Product Design

Written paper, externally assessed, 1 hour, 50 marks

Paper 1 tests the Common content. Candidates answer all questions. Candidates answer on the question paper.

The question paper contains a variable number of structured questions testing candidates' product design skills. Candidates will be expected to demonstrate their knowledge and understanding, communication and application, and analytical and evaluative skills.

A range of question types are used. Some questions may ask candidates to respond using sketches and notes and to apply the knowledge and understanding they have acquired to a particular product, scenario or context. Candidates may be asked to redesign a product for a particular user or need.

Candidates may use a calculator in the exam.

Component 2 – Project

School-based assessment, internally assessed, externally moderated, 100 marks

Component 2 Project forms a significant part of the teaching and assessment requirements of this syllabus. Candidates usually work on their project during the final year of the course.

Each candidate must complete an individual project. Candidates should produce a portfolio of work and a final product. The made product itself is **not** to be submitted.

The project area is decided by the candidate with advice, as appropriate, from the teacher. Cambridge does not prescribe or recommend project areas. The project could focus on the specialist option the candidate has chosen; this approach will allow candidates to further their experience, knowledge and skills in their chosen option. The open nature of design and technology means that a candidate might want to pursue a focus which will involve knowledge, materials and skills from either of the options and the common content; this is permissible.

See also the section *Guidance for centres on Component 2 Project* and the *Coursework Handbook*.

The *Coursework Handbook* for this syllabus is available on our School Support Hub:
www.cambridgeinternational.org/support

Optional components

Paper 3 – Materials

Written paper, externally assessed, 1 hour, 50 marks

Paper 3 tests the optional content on Materials (section 2 of the subject content). Knowledge of the relevant Common content is required.

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

Questions test candidates' knowledge and understanding of the content and skills in the Materials option. Candidates will be expected to demonstrate their communication and application, and analytical and evaluative skills.

Candidates are expected to have knowledge and understanding of all the materials areas specified in the subject content. However, where working knowledge of a material is required, questions are designed to allow candidates to answer with reference to the materials they have most practical experience of working with.

Section A (25 marks) contains a variable number of structured questions. These questions may ask candidates to respond using sketches and notes and to apply the knowledge and understanding they have acquired to a particular product, scenario or context.

Section B (25 marks) contains one structured question focused on a product, scenario or context. Some question parts require candidates to answer using sketches and notes. Prior knowledge of the product, scenario or context is not required.

Candidates may use a calculator in the exam.

Paper 4 – Graphic Products

Drawing paper, externally assessed, 1 hour, 50 marks

Paper 4 tests the optional content on Graphic products (section 3 of the subject content). Knowledge of the relevant Common content is required.

Candidates answer all questions. Candidates answer on pre-printed A3 question sheets which set out specific space for each part question.

Questions test candidates' knowledge and understanding of the content and skills in the Graphic products option. Candidates will be expected to demonstrate their communication and application, and analytical and evaluative skills.

The question paper contains three structured questions. A range of question types are used, including completing formal drawings, sketches and notes and short written answers. Questions will ask candidates to respond to a particular product, scenario or context. Prior knowledge of the product, scenario or context is not required.

Candidates may use a calculator in the exam.

Standard drawing equipment

All candidates taking the Graphic products option should have access to the following basic drawing equipment in the examination:

- A3 drawing board and T-square
- 30°/60° and 45° set squares
- 180° protractor
- pencil compass
- 300 mm rule
- drafting pencils
- coloured pencils
- eraser

Candidates may also use other drafting aids such as trammels and stencils.

Guidance for centres on Component 2 Project

General guidance on Component 2 Project is given with the marking criteria below. For further detail, see the *Coursework Handbook* for this syllabus which is available on our School Support Hub: **www.cambridgeinternational.org/support**

The candidate's portfolio of work is internally marked and externally moderated using the marking criteria. These remain the same year-on-year.

Marking of work should be positive, rewarding achievement where possible, but clearly differentiating across the whole range of marks, where appropriate.

The marker should look at the work and then make a judgement about which level statement is the best fit. In practice, work does not always match one level statement precisely so a judgement may need to be made between two or more level statements.

Guidance and marking criteria

Overview

Section	Mark	Criteria	Mark
Investigating	15	1a: Investigation	9
		1b: Design brief and specification	6
Designing	35	2a: Idea generation	15
		2b: Idea development and final design proposal	20
Making	38	3a: Planning	10
		3b: Making skills	28
Testing and Evaluating	12	4: Final testing and evaluation	12

Investigating

1a: Investigation (9 marks)

Candidates should begin by thoroughly investigating a possible design problem or need, and analysing the factors which will influence the design outcome. Primary and secondary research methods should be used to find all relevant information needed to successfully solve the problem, including analysis of the specific user or client's needs in relation to the problem. Candidates may work with a client or consider a potential user.

Candidates may use AI to support their research. All use of AI must be acknowledged and referenced, with full detail of prompts and questions used. Candidates should check any websites cited by AI and assess the reliability of any material used. Cambridge International has a policy on the use of generative AI by candidates in coursework: **www.cambridgeinternational.org/generative-ai-in-coursework**

Research can also be carried out during the design or development process and presented in later stages of the portfolio, as candidates should use further research and investigation as the product changes and develops.

(i) Identification of a design problem

Level	Description	Marks
3	A design problem is clearly identified with perceptive analysis of factors affecting the design. User/client's needs are fully identified. Needs are investigated in relation to the problem throughout the project.	**5–6**
2	A design problem is identified with some analysis of influential factors potentially affecting the design. User/client's needs are identified. Needs are investigated mostly in relation to the problem through the project.	**3–4**
1	A design problem is presented with little or no analysis. A user/client is identified with little or no investigation of their needs.	**1–2**
0	No creditable response.	**0**

(ii) Investigation and research

Level	Description	Marks
3	Comprehensive and relevant primary and secondary research methods and analysis are used throughout the project to find information useful to solving the identified problem or to help with the development of the design proposal.	**3**
2	Relevant primary or secondary research methods are used through the project, with some analysis, to find information useful to solving the identified problem or to help with the development of the design proposal.	**2**
1	Some primary or secondary research methods are used to find information useful to solving the identified problem or development of design proposal, limited to the start of the project and with limited analysis.	**1**
0	No creditable response.	**0**

1b: Design brief and specification (6 marks)

Candidates should use the information collected in their primary and secondary research, and analysis of the user/client's needs, to generate a design brief and a detailed design specification. Points made should be fully justified and be measurable, giving specific details of the requirements needed. Candidates should consider the social, ethical and environmental impact of their design and include relevant criteria in the specification to address these aspects.

(i) Design brief

Level	Description	Marks
2	Clear design brief is produced which focuses on the needs of the user/client and is informed by the relevant research collected.	**2**
1	Simple design brief is presented with some consideration of the user/client's needs.	**1**
0	No creditable response.	**0**

(ii) Design specification

Level	Description	Marks
2	Clear and detailed design specification is produced with measurable criteria and justification of points, linking directly to the information collected through investigation. Clear and thorough consideration is given to the cultural, social, ethical and environmental factors relating to the design specification.	**3–4**
1	Simple design specification is produced with some justification of points. Some consideration is given to the cultural, social, ethical and environmental factors relating to the design specification.	**1–2**
0	No creditable response.	**0**

Designing

2a: Idea generation (15 marks)

Candidates should be encouraged to use a range of design strategies to help them generate original and different design ideas. Avoiding design fixation at this stage is important to allow the candidate to take risks with their ideas and to allow them to use the iterative design method to develop and improve their ideas as they design. This will allow candidates to produce a wide range of significantly different ideas.

A wide range of communication strategies should be encouraged, from quick design sketching, to constructed 3D drawings. CAD should be used where appropriate and should be used to allow the candidate to explore and develop their ideas with creativity, rather than just as a presentation method.

Candidates should be encouraged to consider the use of structures and mechanisms in their design ideas and may consider the use of electronics.

Candidates may use AI to support thinking, but not to replace their own work. All use of AI must be acknowledged and referenced, with full detail of prompts and questions used. All design ideas must be created by the candidate. Cambridge International has a policy on the use of generative AI by candidates in coursework: **www.cambridgeinternational.org/generative-ai-in-coursework**

Candidates should be evaluating their ideas throughout the process and using the evaluation as a method of refining and selecting the best ideas. Reference to the user/client needs throughout this process will allow the candidate to remain focused on their original brief.

(i) Design strategies and communication methods

Level	Description	Marks
3	A range of design strategies are used to explore the design possibilities. Creativity and originality is shown. Design communication methods are used skilfully. They include 2D and 3D drawing techniques, and CAD where relevant.	**5–6**
2	Some design strategies are used to explore the design possibilities. Some creativity and originality is shown. Design communication methods used include 2D and 3D drawing techniques, and CAD where relevant.	**3–4**
1	Limited strategies and design communication methods are used to produce a small number of ideas.	**1–2**
0	No creditable response.	**0**

(ii) Range of design ideas

Level	Description	Marks
3	A wide range of conceptually different design ideas are generated that are creative, original and relevant to the design specification. Full consideration of cultural, social, ethical and environmental factors is clearly shown in the design ideas and is relevant to the specification.	**4–5**
2	A range of different design ideas are generated with some creativity and originality and some relevance to the specification. Design ideas may show some repetitive elements. Some consideration of cultural, social, ethical and environmental factors is shown in the design ideas with some relevance to the specification.	**2–3**
1	A limited range of design ideas are generated, with repetitive elements and showing limited creativity. There may be little consideration of the specification. Limited consideration of cultural, social, ethical and environmental factors is shown in the design ideas. These may be unrelated to the specification.	**1**
0	No creditable response.	**0**

(iii) Evaluation of specification and needs

Level	Description	Marks
4	Ideas are continually evaluated against the specification criteria and user/client's needs to refine the selection of appropriate solutions.	**4**
3	Evaluation against most of the specification criteria is evident, with reference to the user/client's needs and some justification of the selection of appropriate solutions.	**3**
2	Evaluation against some of the specification criteria is evident, with little reference to the user/client's needs.	**2**
1	Limited evaluation of design ideas is evident with no reference to the specification or to user/client's needs.	**1**
0	No creditable response.	**0**

2b: Idea development and final design proposal (20 marks)

Candidates should be taking the range of ideas generated in section 2a and develop one or more solutions. The iterative method should be used to refine and experiment with the idea, leading to a solution. This should include the use of drawing and sketching methods, as well as modelling techniques to test separate aspects of the design or the design as a whole.

Models should be used to test and refine the idea, with results shown, and the candidate should be encouraged to use the user/client as part of this process. Modelling methods could include two-dimensional (2D) mock-ups of nets or graphics, 3D versions of the product as a whole at full scale or smaller scale, or using CAD to generate and refine 2D images or 3D modelling. Evidence of idea development such as screenshots, printouts or sketches should be included in the portfolio.

Testing of materials and manufacturing methods should take place to allow the candidate to fully justify their methods for realising their idea. This could be done using samples of the materials available to test and experiment with ways of constructing. This could include CAD and CAM where appropriate.

Candidates should be encouraged to use further investigation and research to support the development of their design(s). This should be credited in section 1a.

The final design proposal should be fully presented using appropriate methods and should show the candidate's intentions for what the product should look like. This could be done using traditional hand drawing methods or CAD.

(i) Development of design ideas

Level	Description	Marks
4	Design ideas are fully developed and justified, and show consideration of the specification criteria. Development shows clear progression of ideas using detailed annotations to explore technical aspects such as materials and construction techniques.	**4**
3	Design idea(s) are developed, with some justification and consideration of the specification criteria. Development shows some progression of ideas with annotations relevant to the designs.	**3**
2	Design idea(s) are developed with some changes that may not always be relevant to the specification. Annotation is limited.	**2**
1	Design idea shows limited or little development.	**1**
0	No creditable response.	**0**

(ii) Design communication skills

Level	Description	Marks
4	Skilful use of appropriate drawing and sketching techniques to communicate design ideas with clarity (including CAD where relevant).	**4**
3	Mostly accurate use of appropriate drawing and sketching techniques to communicate design ideas (including CAD where relevant).	**3**
2	Drawing and sketching techniques used to communicate design ideas are mostly appropriate (including CAD where relevant). There may be lack of detail and significant inaccuracies.	**2**
1	Limited use of drawing and sketching techniques. Techniques selected may not be appropriate and communication of design ideas is unclear and inaccurate.	**1**
0	No creditable response.	**0**

(iii) Modelling and testing

Level	Description	Marks
4	Designs are modelled and tested using appropriate techniques (3D and/or CAD where relevant). Testing is effective in justifying decisions on suitable materials and manufacturing methods.	**4**
3	Designs are modelled and tested using mostly appropriate techniques (3D and/or CAD where relevant). Testing enables decisions on materials and manufacturing methods to be made.	**3**
2	Some modelling (3D and/or CAD where relevant) and testing is used. Decisions on materials and manufacturing methods may not be linked to modelling and testing.	**2**
1	Basic modelling used (3D and/or CAD where relevant) and/or basic testing. Some decisions are made but with little or no supporting evidence.	**1**
0	No creditable response.	**0**

(iv) Evaluation of design ideas

Level	Description	Marks
4	Design ideas are evaluated in detail against all aspects of the specification. The user/client's needs are carefully considered. Any decisions on changes to the original specification are fully justified.	**4**
3	Design ideas are evaluated against most aspects of the specification. The user/client's needs are mostly considered. Any decisions on changes to the original specification are discussed.	**3**
2	Design ideas are evaluated against some aspects of the specification. There is little consideration of the user/client's needs. There is little detail of any changes to the original specification.	**2**
1	Limited evaluation of the design ideas with little or no reference to the specification or any changes made. There is no consideration of the user/client's needs.	**1**
0	No creditable response.	**0**

(v) Final design proposal

Level	Description	Marks
4	Final design proposal is clearly developed from the original idea(s) and is presented with accuracy using appropriate methods. Design proposal includes all relevant details of dimensions, materials and construction techniques.	**4**
3	Final design proposal shows development from the original idea(s) and is presented using appropriate methods. Design proposal includes most relevant details of dimensions, materials and construction techniques.	**3**
2	Final design proposal shows some development from the original idea(s) and is presented using some appropriate methods. Design proposal may lack details of dimensions, materials and construction techniques.	**2**
1	Final design proposal is presented but shows little development from original ideas. Design proposal has limited detail.	**1**
0	No creditable response.	**0**

Making

3a: Planning (10 marks)

Candidates should produce detailed working drawings of all aspects of their final design proposal to aid the making of the product. This could include layout drawings for nets, orthographic drawings of components for the whole product, or manufacturing drawings for computer-aided manufacture of specific components. These could be presented using CAD or by traditional hand-drawn methods.

All stages of manufacture should be considered and planned before the candidate starts making their product. This should also include details of components and sizes of materials.

(i) Working drawings

Level	Description	Marks
2	Mostly detailed and dimensioned working drawings are produced of the final design proposal which present the required information to make the product.	**3–4**
1	Basic working drawings are produced which show some of the information required to make the product.	**1–2**
0	No creditable response.	**0**

(ii) Plan of making

Level	Description	Marks
3	Clear and detailed plan is produced, showing the correctly sequenced stages of making. Plan includes details of materials, quantities and processes involved in making the final product and consideration of health and safety, ethical and environmental factors at all relevant stages.	**5–6**
2	Most stages of making are identified and sequenced. Plan includes some detail of materials, quanitities and processes involved in making the final product, and some consideration of health and safetly, ethical and environmental factors.	**3–4**
1	Limited planning of making is evident. Plan includes limited detail of processes involved in making the final product and limited consideration of health and safety, ethical and environmental factors.	**1–2**
0	No creditable response.	**0**

3b: Making skills (28 marks)

The candidate should make a high-quality final product, using their prior planning and working drawings to guide them through the process. They should use a range of tools and equipment with skill to create a product which works as intended and should demonstrate safe working practices.

The use of CAM should be encouraged where available. The final product should show a range of different manufacturing skills which may include digital design and manufacturing processes. It may not have been appropriate to use hand tools and machinery in the manufacture of the final product. Where this is the case, the candidate should be assessed on the skill level of using hand tools and machinery in earlier modelling or prototyping and on the range of tools used across the project as a whole.

Candidates should carefully record each stage of making, including justification of any changes or developments they decide to make and evidence of quality assurance they have completed during the making process. Annotated photographic evidence would be an appropriate method of recording the making.

(i) Making techniques and processes used throughout the project

Level	Description	Marks
4	A consistently high level of skill is shown with a range of tools and equipment and/or digital design and manufacture used throughout the project. Techniques and processes are appropriate to the materials being used and are appropriate to the plan of making. Quality assurance is evident through testing and analysis throughout the making processes to check thoroughly for tolerances and blemishes.	**10–12**
3	A good level of skill is shown with a range of tools and equipment and/or digital design and manufacture used throughout the project. Techniques and processes are appropriate to the materials being used and are appropriate to the plan of making. Some quality assurance is evident through testing and analysis during the making processes to check for problems with tolerances and blemishes.	**7–9**
2	Some skill is shown with a range of the tools and equipment and/or digital design and manufacture used throughout the project. Techniques and processes are mostly appropriate to the materials being used and are mostly appropriate to the plan of making. Some quality assurance is evident during the making processes to correct obvious problems with tolerances and blemishes.	**4–6**
1	A limited range of techniques is shown, with a limited range of tools and equipment and/or digital design and manufacture used. Very little testing or analysis of the product, its parts and materials is done during the making processes.	**1–3**
0	No creditable response.	**0**

(ii) Safe working practices

Level	Description	Marks
3	Tools, materials and equipment are consistently operated safely, and appropriate PPE is used correctly.	**3**
2	Tools, materials and equipment are mostly operated safely, and use of PPE is mostly correct and appropriate.	**2**
1	Limited consideration is given to safe use of tools, materials, equipment and PPE.	**1**
0	No creditable response.	**0**

(iii) Record of making

Level	Description	Marks
3	Most stages of making are recorded and are mostly clear and detailed, including any changes to the product during making.	**3**
2	Some stages of making are recorded with little detail.	**2**
1	Limited record of some stages of making.	**1**
0	No creditable response.	**0**

(iv) Function and quality of final product

Level	Description	Marks
4	The final product fully meets all the requirements of the brief and specification and is fully functioning and fit for purpose. The final product demonstrates high levels of accuracy and is finished to a very high standard without blemishes.	**9–10**
3	The final product meets most of the requirements of the brief and specification and is mostly functioning and fit for purpose. The final product demonstrates accuracy and is finished to a good standard with few blemishes.	**6–8**
2	The final product meets some of the requirements of the brief and specification and is partially functioning. The final product contains some inaccuracies and has some blemishes.	**3–5**
1	The final product meets a limited number of requirements of the brief and specification and has limited function. The final product is incomplete and may contain significant mistakes, inaccuracies and blemishes.	**1–2**
0	No creditable response.	**0**

Testing and evaluating

4: Final testing and evaluation (12 marks)

Candidates should be encouraged to fully test their final product in the environment it is intended for. Meaningful testing should take place and be recorded and used to suggest realistic further improvements to the design. The opinions of the client/user should be considered and testing of the product where possible should include the client/user.

The final product should be evaluated against the original specification and brief and any reasons why it does not meet the criteria should be fully justified.

Sustainability is an important aspect of the product and should be considered when evaluating and suggesting improvements. If their final product is made using unsustainable methods, candidates should suggest ways or changes they could make to improve the sustainability of the design.

(i) Final testing

Level	Description	Marks
2	Objective testing of the final product with detailed reference to its performance, the client/user and the design specification.	**3–4**
1	Some testing of the final product with some reference to its performance, the client/user and the design specification.	**1–2**
0	No creditable response.	**0**

(ii) Final evaluation

Level	Description	Marks
4	Any changes made to the design or processes during making are clearly evidenced and justified. Critical and detailed analysis and evaluation of the final product is made, considering the original brief and specification, outcomes of testing, and the cultural, social, ethical and environmental impact of the final product throughout its life cycle. Meaningful conclusions are made, with detailed and justified proposals for further development of the final product.	**7–8**
3	Any changes made to the design or processes during making are evidenced. Analysis and evaluative comments are made about the final product, with some consideration of the original brief and specification, outcomes of testing, and the cultural, social, ethical and environmental impact of the final product throughout its life cycle. Some appropriate conclusions are made, with some proposals for further development of the final product that mostly reference the evaluation.	**5–6**
2	Any changes made to the design or processes during making are noted. Brief evaluative comments are made about the final product, and include limited consideration of the original brief and specification, outcomes of testing, and the cultural, social, ethical and environmental impact of the final product throughout its life cycle. Few conclusions are made, with limited proposals for further development of the final product that may not refer to the evaluation.	**3–4**
1	Any changes made during making are not evidenced. Limited evaluative comments and/or suggestions for improvement of the final product are made. Comments do not reference the original brief, specification or outcomes of testing.	**1–2**
0	No creditable response.	**0**

Supervising coursework

Coursework must be a candidate's own, unaided work. The teacher must be able to authenticate the work is the candidate's own.

A general discussion on the progress of coursework is a natural part of the teacher–candidate relationship, as it is for other parts of the course. Candidates can revise their work following feedback, but you should only give brief summative comments on progress.

Teachers can support candidates by reviewing their work before it is handed in for final assessment. Teachers can do this orally or through written feedback. Teachers should not correct or edit draft coursework. Advice should be kept at a general level so that the candidate leads the discussion and makes the suggestions for any amendments. Teachers must not give detailed advice to individual candidates or groups of candidates on how their work can be improved to meet the assessment criteria.

For further information about supervising coursework, see the *Cambridge Handbook* for the relevant year of assessment at **www.cambridgeinternational.org/eoguide**

Authenticity and academic honesty

It is the centre's responsibility to make sure all assessed work is the candidate's original work. Candidates must not submit someone else's work as their own, or use material produced by someone else without citing and referencing it properly. You should make candidates aware of the academic conventions governing quotation of, and reference to the work of others, and teach candidates how to use them.

A candidate taking someone else's work or ideas and passing them off as their own is an example of plagiarism. It is your responsibility as a teacher to prevent plagiarism from happening and to detect it if it does happen. For more information, search for 'Preventing plagiarism – guidance for teachers' on our website at **www.cambridgeinternational.org/teachingandassessment**. Cambridge International has robust systems in place to detect, investigate and address plagiarism once work has been submitted.

Cambridge International has a policy on the use of generative AI by candidates in coursework. The inappropriate use of AI should be treated as a form of plagiarism. The policy includes guidance on how to detect use of AI in coursework and what action teachers should take. It can be found at: **www.cambridgeinternational.org/generative-ai-in-coursework**

You will be required to declare the authenticity of the work when submitting work.

Using the samples database

The samples database refers you to key information about the administration of externally moderated coursework, speaking tests, externally set assignments and examined coursework for each syllabus.

Use the samples database to find out:

- when and how to submit your marks for moderated coursework and moderated non-coursework tests
- when and how to submit your candidates' work
- which forms to complete and submit with your candidates' work.

The samples database at **www.cambridgeinternational.org/samples** will ask you for:

- the qualification type (e.g. Cambridge International AS & A Level, Cambridge IGCSE and O Level, Cambridge Checkpoint Global Perspectives)

- your country / territory
- the exam series (e.g. June, November)
- the syllabus code (i.e. 6043 for this syllabus).

The samples database will then take you to the information you need, including dates and methods of submission of candidates' marks and work, as well as any forms you may need to complete.

Recording and submitting candidates' marks and work

Please refer to the samples database at **www.cambridgeinternational.org/samples** for information, dates and methods of submission of candidates' marks and work. You should follow the instructions for 6043/02 Project on the samples database.

You should record marks on the required forms which you should download each year from the samples database at **www.cambridgeinternational.org/samples**. Follow the instructions on the forms to complete them. The marks on these forms must be identical to the marks you submit to Cambridge International.

Internal moderation

If more than one teacher in your centre is marking internal assessments, you must make arrangements to standardise your teachers' marking so that all candidates are assessed to a common standard. After work has been internally assessed, you must arrange for an internal moderation stage to check the marking of each teacher. This is to ensure that all marking within the centre is consistent. If only one teacher is marking internal assessments, no internal moderation is necessary. You can find further information on the process of internal moderation in the *Cambridge Handbook* and on the samples database for the relevant year of assessment.

You should record the internally moderated marks for all candidates on the required forms and submit these marks to the Mauritius Examinations Syndicate (MES).

External moderation

Moderators appointed by MES will moderate all marking by centres on behalf of Cambridge International.

- You must submit the marks of all candidates to MES on the required forms listed on the samples database at **www.cambridgeinternational.org/samples**
- You must also submit the marked work of a sample of candidates to MES. The sample you submit should include examples of the marking of each teacher.
- You should also submit the Individual Candidate Record Cards of candidates selected for the sample.

After moderation in Mauritius, MES will send a representative sample to Cambridge International.

Glossary

Term	Definition
Aesthetics	concerned with the appearance or look of a product
Anthropometrics	the study of measurements and data of the human body that is used in designing products and systems
Brief	a short, clear statement outlining what the design needs to achieve
Commercial manufacturing	manufacturing method used to produce products in quantity
Design proposal	suggestion(s) for a design of a product that is developed using the criteria and needs given
Design solution	a design idea or development of an idea that meets the required needs. This can be a drawn design, a prototype or an existing product
Digital design	digital design uses computers, graphics tablets, and various electronic devices to design and create products in a digital format
Ergonomics	the study of people and their working conditions to improve user experience with a product or system
Gantt chart	a chart that shows a project schedule, showing the start dates and durations of different tasks in the project
Inclusivity	producing designs, or modified designs, that are suitable for all users
Innovation	the use of new methods or ideas to generate or develop design proposal
Iterative design	a cyclic process of prototyping, testing, analysing, and refining a product or process, where each version is improved based on feedback and evaluation
Planned obsolescence	deliberately designing the life cycle of a product to be short, forcing the user to update their products quickly
PPE	personal protective equipment (PPE) such as eye protection, gloves and face masks
Pre-manufactured components	parts or components that are manufactured elsewhere and bought in to produce products
Prototype	an early model or sample of a product used to test a concept
Quality assurance	checks that are done during a manufacturing process to ensure the product meets the customers' expectations
Specification	a detailed list of the functions and features that a design must have
Stock forms	the standard shapes, sizes and forms that a material can be bought in
Sustainability	the use of resources and energy in a way that meets the needs of the present generation without compromising the ability of future generations to meet their own needs

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
Describe	state the points of a topic / give characteristics and main features
Explain	set out purposes or reasons / make the relationships between things clear / say 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
Sketch	make a simple freehand drawing showing the key features, taking care over proportions
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.

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 design and technology.

Guided learning hours

We design Cambridge O Level 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

You can enter candidates in the November exam series.

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

Private candidates cannot 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 Design & Technology (0445)
- Cambridge IGCSE (9-1) Design & Technology (0979)
- syllabuses with the same title at the same level.

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

Making entries

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. Please refer to the *Cambridge Guide to Making Entries* for the relevant series for the correct entry option code.

Retakes and carrying forward marks

Candidates can retake the whole qualification as many times as they want to.

Learn more about retake entries, including definitions and information on entry deadlines, at **www.cambridgeinternational.org/retakes**

Candidates cannot resubmit, in whole or in part, coursework from a previous series for remarking. For information, refer to the *Cambridge Handbook* for the relevant year of assessment at **www.cambridgeinternational.org/eoguide**

Marks achieved in O Level Design & Technology 6043 Component 2 Project can be carried forward to future series, subject to the requirements set out in the *Cambridge Handbook* for the relevant year of assessment and the *Carry-forward regulations supplement* at **www.cambridgeinternational.org/eoguide**

To confirm what entry options are available for this syllabus, refer to the *Cambridge Guide to Making Entries* for the relevant series. Regulations for carrying forward component marks can be found in the *Cambridge Handbook* for the relevant year of assessment at **www.cambridgeinternational.org/eoguide**

Language

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

Accessibility and equality

Syllabus and assessment design

At Cambridge we recognise that our candidates have highly diverse socio-economic, cultural and linguistic backgrounds, and may also have a variety of protected characteristics. Protected characteristics include special educational needs and disability (SEND), religion and belief, and characteristics related to gender and identity.

We follow accessible design principles to make our syllabuses and assessment materials as accessible and inclusive as possible. We review language accessibility, visual resources, question layout and the contexts used in questions. Using this approach means that we give all candidates the fairest possible opportunity to demonstrate their knowledge, skills and understanding.

Access arrangements

Our design principles aim to make sure our assessment materials are accessible for all candidates. To further minimise barriers faced by candidates with SEND, illness or injury, we offer a range of access arrangements and modified papers. This is the principal way in which we comply with our duty to make 'reasonable adjustments', as guided by the UK Equality Act 2010.

Requested access arrangements should be based on evidence of the candidate's barrier to taking an assessment and should also reflect their normal way of working. For Cambridge to approve an access arrangement, we need to agree that it constitutes a reasonable adjustment and does not affect the security or integrity of the assessment. This is explained in section 1.3 of the *Cambridge Handbook* **www.cambridgeinternational.org/eoguide**

Applying for access arrangements

- Details of our standard access arrangements and modified question papers are available in section 1.3 of the *Cambridge Handbook* **www.cambridgeinternational.org/eoguide**
- Centres are expected to check the availability of access arrangements and modified question papers at the start of the course. Check the *Cambridge Handbook*, the assessment objectives listed in the syllabus document and, where applicable, any access arrangement restrictions listed in the syllabus document
- Contact us at the start of the course to find out if we can approve an access arrangement that is not listed in the *Cambridge Handbook*.
- All applications should be made by the deadlines published in the *Cambridge Handbook*.

After the exam

Grading and reporting

Grades A*, A, B, C, D or E indicate the standard a candidate achieved at Cambridge O Level.

A* is the highest and E is the lowest. 'Ungraded' means that the candidate's performance did not meet the standard required for grade E. '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, Cambridge O Level is shown as GENERAL CERTIFICATE OF EDUCATION ORDINARY LEVEL.

On certificates, Cambridge O Level is shown as General Certificate of Education.

How students and teachers can use the grades

Assessment at Cambridge O Level 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 or likely to be successful in a particular course or career.

The outcomes help students choose the most suitable course or career.

Changes to this syllabus for 2028, 2029 and 2030

The syllabus has been reviewed and revised for first examination in 2028.

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

Changes to syllabus content	• The Common content (previously Product design) has been refreshed to include foundational content on drawing techniques, material classification, structures, mechanisms and electronics • The section 'Resistant materials' has been renamed 'Materials' and is one of two options • Graphic products has been introduced as an option • Sustainable design approaches have been embedded throughout the common and optional content.
Changes to assessment (including changes to specimen papers)	• The Aims have been refreshed • The Assessment Objectives (AOs) have been updated; there are now four AOs • Paper 1 Product Design has been redesigned to focus on the Common content and reduce the emphasis on idea generation. Optional questions have been removed. Candidates answer on the question paper. The duration has been reduced to 1 hour • The guidance and marking criteria for Component 2 Project have been revised • Paper 3 Materials has been refreshed to allow candidates to answer with knowledge of the materials they are most familiar with. Optional questions have been removed. Candidates answer on the question paper. The duration is unchanged • Paper 4, Graphic Products, assesses the new option, Graphic products.
Other changes	• An updated *Coursework Handbook* for this syllabus will be published on the School Support Hub **www.cambridgeinternational.org/support**
Carry forward arrangements	• Marks achieved in 6043 Design & Technology Component 2 Project in 2027 can be carried forward to future series of 6043 Design & Technology, subject to the regulations set out in the *Cambridge Handbook* for the relevant year of assessment and the *Carry-forward regulations supplement* at **www.cambridgeinternational.org/eoguide**

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 show how students should answer questions to meet the assessment objectives.

Any textbooks endorsed to support the syllabus for examination from 2028 are suitable for use with this syllabus.

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

Quality management

We are 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/**

Ref: 1398466605; Jordan Lye; *Orange color plastic chair with wooden legs on white background* – stock photo; **www.getty.co.uk**

We are committed to making our documents accessible in accordance with the WCAG 2.1 Standard. We are always looking to improve the accessibility of our documents. If you find any problems or you think we are not meeting accessibility requirements, contact us at **info@cambridgeinternational.org** with the subject heading: Digital accessibility. If you need this document in a different format, contact us and supply your name, email address and requirements and we will respond within 15 working days.

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