

SYLLABUS

**Cambridge O Level
Design and Technology**

6043

For examination in November 2015

Changes to syllabus for 2015

This syllabus has been updated, but there are no significant changes.

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1. Introduction

1.1 Why choose Cambridge?

Recognition

Cambridge International Examinations is the world's largest provider of international education programmes and qualifications for learners aged 5 to 19. We are part of Cambridge Assessment, a department of the University of Cambridge, trusted for excellence in education. Our qualifications are recognised by the world's universities and employers.

Cambridge O Level is internationally recognised by schools, universities and employers as equivalent in demand to Cambridge IGCSE® (International General Certificate of Secondary Education). Learn more at www.cie.org.uk/recognition

Excellence in education

Our mission is to deliver world-class international education through the provision of high-quality curricula, assessment and services.

More than 9000 schools are part of our Cambridge learning community. We support teachers in over 160 countries who offer their learners an international education based on our curricula and leading to our qualifications. Every year, thousands of learners use Cambridge qualifications to gain places at universities around the world.

Our syllabuses are reviewed and updated regularly so that they reflect the latest thinking of international experts and practitioners and take account of the different national contexts which they are taught.

Cambridge programmes and qualifications are designed to support learners in becoming:

- **confident** in working with information and ideas – their own and those of others
- **responsible** for themselves, responsive to and respectful of others
- **reflective** as learners, developing their ability to learn
- **innovative** and equipped for new and future challenges
- **engaged** intellectually and socially, ready to make a difference.

Support for teachers

A wide range of materials and resources is available to support teachers and learners in Cambridge schools. Resources suit a variety of teaching methods in different international contexts. Through subject discussion forums and training, teachers can access the expert advice they need for teaching our qualifications. More details can be found in Section 2 of this syllabus and at www.cie.org.uk/teachers

Support for exams officers

Exams officers can trust in reliable, efficient administration of exams entries and excellent personal support from our customer services. Learn more at www.cie.org.uk/examsOfficers

Not-for-profit, part of the University of Cambridge

We are a not-for-profit organisation where the needs of the teachers and learners are at the core of what we do. We continually invest in educational research and respond to feedback from our customers in order to improve our qualifications, products and services.

Our systems for managing the provision of international qualifications and education programmes for learners aged 5 to 19 are certified as meeting the internationally recognised standard for quality management, ISO 9001:2008. Learn more at **www.cie.org.uk/ISO9001**

1.2 Why choose Cambridge O Level?

Cambridge O Levels have been designed for an international audience and are sensitive to the needs of different countries. These qualifications are designed for students whose first language may not be English and this is acknowledged throughout the examination process. The Cambridge O Level syllabus also allows teaching to be placed in a localised context, making it relevant in varying regions.

Our aim is to balance knowledge, understanding and skills in our programmes and qualifications to enable candidates to become effective learners and to provide a solid foundation for their continuing educational journey.

Through our professional development courses and our support materials for Cambridge O Levels, we provide the tools to enable teachers to prepare students to the best of their ability and work with us in the pursuit of excellence in education.

Cambridge O Levels are considered to be an excellent preparation for Cambridge International AS and A Levels, the Cambridge AICE (Advanced International Certificate of Education) Group Award, Cambridge Pre-U, and other education programmes, such as the US Advanced Placement program and the International Baccalaureate Diploma programme. Learn more about Cambridge O Levels at **www.cie.org.uk/cambridgesecundary2**

Guided learning hours

Cambridge O Level syllabuses are designed on the assumption that candidates have about 130 guided learning hours per subject over the duration of the course, but this is for guidance only. The number of hours required to gain the qualification may vary according to local curricular practice and the learners' prior experience of the subject.

1.3 Why choose Cambridge O Level Design and Technology?

Cambridge O Levels are established qualifications that keep pace with educational developments and trends. The Cambridge O Level curriculum places emphasis on broad and balanced study across a wide range of subject areas. The curriculum is structured so that candidates attain both practical skills and theoretical knowledge.

Cambridge O Level Design and Technology is accepted by universities and employers worldwide as proof of knowledge and understanding of the subject.

Candidates following this syllabus focus on problem-solving design activities which involve practical, manipulative work using a range of materials. As a result, they learn about:

- Design and graphics.

- The use of different materials (plastics, wood and metals).
- The practical processes involved in workmanship and construction.

The course is designed to develop technical and manipulative skills, enabling candidates to understand how these skills can be used. Candidates also learn about the possible hazards associated with practical workshop activities, thereby encouraging safe working habits.

Prior learning

Candidates beginning this course are not expected to have studied Design and Technology previously.

Progression

Cambridge O Levels are general qualifications that enable candidates to progress either directly to employment, or to proceed to further qualifications.

Candidates who are awarded grades A* to C in Cambridge O Level Design and Technology are well prepared to follow courses leading to Cambridge International AS and A Level Design and Technology, or the equivalent.

1.4 How can I find out more?

If you are already a Cambridge school

You can make entries for this qualification through your usual channels. If you have any questions, please contact us at **info@cie.org.uk**

If you are not yet a Cambridge school

Learn about the benefits of becoming a Cambridge school at **www.cie.org.uk/startcambridge**. Email us at **info@cie.org.uk** to find out how your organisation can register to become a Cambridge school.

2. Teacher support

2.1 Support materials

Cambridge syllabuses, past question papers and examiner reports to cover the last examination series are on the *Syllabus and Support Materials* DVD, which we send to all Cambridge schools.

You can also go to our public website at **www.cie.org.uk/olevel** to download current and future syllabuses together with specimen papers or past question papers and examiner reports from one series.

For teachers at registered Cambridge schools a range of additional support materials for specific syllabuses is available online. For Teacher Support go to **<http://teachers.cie.org.uk>** (username and password required).

2.2 Resource lists

We work with publishers providing a range of resources for our syllabuses including textbooks, websites, CDs etc. Any endorsed, recommended and suggested resources are listed on both our public website and on Teacher Support.

The resource lists can be filtered to show all resources or just those which are endorsed or recommended by Cambridge. Resources endorsed by Cambridge go through a detailed quality assurance process and are written to align closely with the Cambridge syllabus they support.

2.3 Training

We offer a range of support activities for teachers to ensure they have the relevant knowledge and skills to deliver our qualifications. See **www.cie.org.uk/events** for further information.

3. Assessment at a glance

Paper 1: Tools, materials and processes

Part A (30% of Paper 1)

Ten short-answer questions.

Part B (70% of Paper 1)

Section 1: Tools and materials

Section 2: Processes

Candidates must answer **four** questions: one from Section 1, two from Section 2, plus one from either section.

Weighting: 40% of total marks

Paper 2: Design project

Project themes are set by Cambridge and will be notified to schools in January for examinations taken in November. It is important that candidates have the opportunity to access facilities whereby the realisation of their products can be achieved.

The project will comprise two interrelated components:

Part A: The design folio

Part B: The design artefact

Weighting: 60% of total marks

Availability

This syllabus is examined in the November examination series.

Detailed timetables are available from www.cie.org.uk/examsOfficers

This syllabus is not available to private candidates.

Cambridge O levels are available to Centres in Administrative Zones 3, 4 and 5. Centres in Administrative Zones 1, 2 or 6 wishing to enter candidates for Cambridge O Level examinations should contact Cambridge Customer Services.

Combining this with other syllabuses

Candidates can combine this syllabus in an examination session with any other Cambridge syllabus, except:

- syllabuses with the same title at the same level

Please note that Cambridge O Level, Cambridge IGCSE and Cambridge International Level 1/Level 2 Certificate syllabuses are at the same level.

4. Syllabus aims and assessment objectives

4.1 Aims

The aims of the course are the same for all candidates. They are not listed in order of priority.

The aims are:

- To promote problem-solving design activity.
- To develop appropriate technical skills to enable the realisation of solutions to design problems.
- To develop knowledge of a range of materials and the appropriate manipulative skills.
- To develop an understanding of some aspects of technological activity.
- To develop appropriate graphical skills to enable full engagement in design activity.
- To develop awareness of possible hazards associated with practical workshop activities and to encourage habits of safe working.

4.2 Assessment objectives

Candidates should be able to:

1. Identify clearly, from a problem situation, a specific need for which a solution is required.
2. Define and analyse a problem by considering any relevant functional, aesthetic, human, economic and environmental factors.
3. Investigate, research, collect and record relevant information.
4. Demonstrate the ability to apply knowledge to solve problems.
5. Exercise judgement relating to appropriate functional, technological and aesthetic factors.
6. Develop ideas towards a solution.
7. Communicate ideas by using appropriate methods.
8. Plan and organise the work procedure involved in the realisation of a solution.
9. Realise a solution in appropriate material(s), using suitable techniques.
10. Demonstrate a knowledge of materials, by showing an understanding of their characteristics in relation to their use.
11. Demonstrate an awareness of the technological and cultural environment.
12. Test and evaluate a design solution.
13. Demonstrate ability in design, communication, craftsmanship and appropriate technology.
14. Demonstrate the ability to apply previously learned knowledge.

5. Description of papers

5.1 Paper 1: Tools, materials and processes

2½ hours, 80 marks

This paper is sent to Cambridge for marking. It will be marked out of 95 and then scaled to a mark out of 80. It represents 40% of the total marks for the subject.

A formal, timed examination in which candidates will be required to show their knowledge and understanding of tools, materials and processes associated with the use of metal, wood and plastics in the production of artefacts made to satisfy needs. They will be expected to call upon experience of working these materials (see core content) and to demonstrate that their knowledge of at least one of the identified materials has been extended beyond that of the core experience.

Candidates are expected to study the three types of material – metal, plastic and wood – with one material being treated as the first discipline. They should also have a good working experience of a second material, and some knowledge of the third is expected.

Part A (30% of Paper 1 marks)

Ten questions requiring short answers, based on a wide knowledge of materials, processes, tools, equipment terminology, graphic representation and interpretation.

Part B (70% of Paper 1 marks)

Section 1: Tools and materials

Section 2: Processes

Candidates must answer one question from Section 1, two from Section 2, plus one other from either section.

Candidates are free to make use of colour, other media and materials for the communication of ideas in their answers.

The examination will use metric units.

5.2 Paper 2: Design project

Completed over a period of two terms, 120 marks.

This paper represents 60% of the total marks for the subject.

Cambridge sets the project themes and will despatch them to schools in January for examinations taken in November. In order to be duly received, Centres must make estimated entries for this syllabus. Estimated entries for centres in Mauritius are handled by MES. Instructions and timescales for all other centres making estimated entries are in the *Cambridge Administrative Guide*, available on our website.

The folio will be marked by the candidate's teacher, who must use the criteria given in Section 6.2. The form necessary for the recording of marks for both Part A and Part B is included at the end of this syllabus.

Details regarding external moderation of coursework can be found on page 13.

The project will be a personally identified design opportunity, within the thematic topic set by Cambridge, and will comprise two interrelated components:

Part A – the design folio

Part B – the design artefact

Part A: The design folio

The folio is to show the candidate's brief, analysis, investigation, design proposals and evaluations.

The candidate will be expected to survey the general thematic topic, with a view to selecting a particular problem for resolution.

The design brief which the candidate formulates will lead to further investigation. The candidate must include evidence of how this information is used, and of the basis of judgements made in the development of the design proposal.

The candidate must identify and set down as a plan for production the anticipated procedures for realising the artefact. This might be in the form of a flow diagram which is further elaborated by sketches to clarify and work out how some of the critical stages will be dealt with.

The candidate should use appropriate graphical methods throughout the folio, including sequential sketches and the use of colouring media. Any notes should generally be succinct, and used only to clarify certain details.

Part B: The design artefact

In realising the solution to the personally selected design problem, the candidate is expected to demonstrate refined workmanship, sensitive use of materials and appropriate constructional methods. Candidates need not restrict their design to the three materials within the syllabus, but should take any opportunity to make use of their knowledge of the developing technologies.

6. Syllabus content

In order to meet the requirements of this examination, all candidates should have followed the core syllabus in order to gain a sound working knowledge and understanding of plastics, wood and metal. This syllabus should be completed before the adoption of the final project, which it is expected will call for further research and specialisation. With this in mind, the syllabus aims to encourage the inclusion of other materials and technologies when appropriate.

It is hoped that teachers will endeavour to involve pupils in discussion and debate whenever appropriate.

Safety

It is assumed that a proper and appropriate concern for safety codes and practices will be maintained throughout a course following this syllabus.

Design and technology in society

It is important that candidates obtain an appreciation of aesthetics and a pride in craftsmanship, along with understanding of the responsibility and place of the designer craftsman and technologist in society and industry. Some effects of the rapid developments in technology on the individual, and future trends and expectations, should be considered.

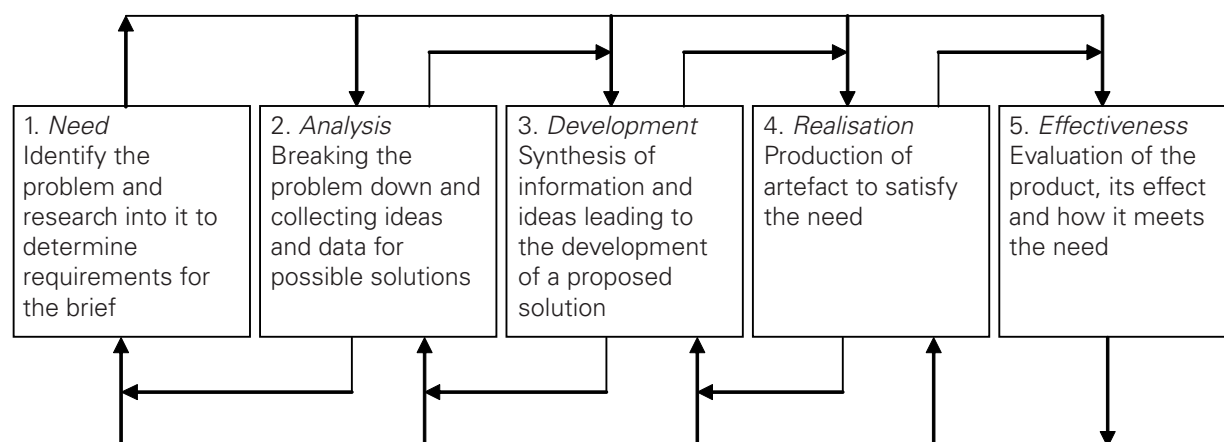
Syllabus

1. Design

1.1 Design method

Designing is concerned with creating change and is undertaken in many different ways. It involves rational thought undertaken in a logical sequence, but it also involves intuitive responses. For this examination, design is concerned with problem-centred situations calling for solutions that can be realised through manufactured artefacts. The solutions may be arrived at through diverse methods, but each will include the statement of a BRIEF, ANALYSIS, SYNTHESIS and EVALUATION.

A convenient model to help pupils engage in design activity might be:



The arrows show that it is not always a linear series, that there is frequent looping back, particularly an ongoing reappraisal of the nature of the need. The arrows at the top showing forward links indicate, for example, that when considering the nature of the need (box 1) the resources available for realisation (box 4) and the constraints must be kept in mind. Similarly, the likely effects (box 5) need to be anticipated at every stage.

Essential to the activity is the ability to use graphical techniques. There is often a need to model in other ways, so as to visualise a possible solution or part solution.

The production stage calls for logical planning of the practical processes and the evaluation must be as objective as possible including, where appropriate, quantifiable testing.

1.2 Design Content

<i>Aesthetics</i>	A basic appreciation of the use of line, shape, form, proportion, space, colour and texture.
<i>Anthropometrics and ergonomics</i>	An appreciation of the concept of ergonomics and the incorporation of anthropometric data in design, where appropriate.
<i>Information</i>	Practice in gathering relevant information by searching out data from reference sources and enquiry through research and observation. The influence of natural forms on the man-made environment. The influence of materials and processes on the shape of man-made artefacts.
<i>Awareness</i>	A basic understanding of common mathematical shapes in product design, the use of triangulation and the modular principle. A basic appreciation of design evolution through a recognition of how designers respond, as time progresses, to changing pressures and influences.

Teachers and candidates are asked to take particular note of the Assessment Objectives, the Teacher's Guide to Assessment, and the Criteria for the Assessment of the Project.

1.3 Graphics

The ability to show ideas and constructions by pictorial drawing, exploded and sectional views by recognised methods, the principle aim being to achieve fluency. This does not preclude the ability to produce measured orthographic drawings, where appropriate.

The use of ink, colouring media, line, shape, form and texture should be encouraged, so that candidates come to understand the importance of good presentation. Explanations using sequential sketches and flow diagrams are required.

2. Technology

2.1 Materials

General physical and working properties and the applications of common constructional materials, especially plastics, wood and metal. Simple comparative testing leading to the reasoned selection of materials. A broad understanding with practical experience, rather than an in-depth knowledge of any particular material, technology or media. Examples of areas which should be covered are given as guidance.

2.2 Theoretical knowledge

<i>Plastics</i>	Thermoplastics – nylon, polythene, polyvinylchloride, acrylic and polystyrene. Thermosets – polyester resin including G.R.P., melamine, urea and phenol formaldehyde.
<i>Wood</i>	Natural timbers – classification advantages and disadvantages in use. Seasoning, storage and care of timber during use and construction Processed wood – plywood, blockboard, chipboard, veneer and hardboard.
<i>Metals</i>	Ferrous – mild steel and high carbon steels. Non ferrous – aluminium and the alloy Duralumin, along with the common casting alloys. Copper and its alloys. Zinc, lead and tin. A knowledge of different and appropriate properties and uses, rather than of methods of manufacture.

2.3 Practical processes

Experience in the use of hand and machine tools, operations and processes should cover the major materials – metal, plastic and wood – in sufficient detail to enable candidates to fulfil the realisation of their designs with sensitivity and manipulative skill, to produce artefacts showing a high degree of design awareness and of craftsmanship.

Area of activity	Core	Expansion
1. Preparation of materials Knowledge of available forms, types, sizes – conversion/cutting ready for use – datum surfaces/lines for future use – preparation for machine processes.	Hacksaw, guillotine, tenon saw, cross-cut and panel saws.	Purpose-built portable tools. Securing work to face-plates, lathe chucks or between centres. Filing/planing of datum edge/surface.
2. Setting/marking out Measuring and/or marking of work, so that future operations can be carried out successfully, accurately and speedily.	Rule, try-square, scribe, chinagraph pencil, marking knife and pencil. Centre punch.	Marking of datum line, by surface plate and scribing block or calipers. Vernier gauge. Micrometer. Dividers, marking gauge and mortise gauge.

<p>3. Shaping</p> <p>(a) Deforming/reforming Methods which rely on a rearrangement of material, rather than its removal, to give the desired shape, form or contour.</p>	<p>Hollowing, bending, forming by heating/pressure, simple casting, steam bending and lamination.</p>	<p>Use of moulds, formers and dies, vacuum, blow or adhesive assisted. Casting to form by heat, pressure, chemical process or in combination.</p>
<p>(b) Wastage/addition Various forms of cutting and removal of, or joining and adding to, a material, to give the desired shape, form or contour.</p>	<p>Hand snips, saws, files, rasps, basic planes and abrasive cutters. Simple hole-boring by hand and machine. Hand threading and tapping.</p>	<p>Pilot, clearance, tapping, countersunk and counterbored holes. Screw cutting. Special-purpose planes, chisels, gauges, saws; abrasive mops, discs and belts, in addition to special files and rasps.</p>
<p>4. Special treatments Those which so change the molecular structure of a material as to make it more suitable for the work it is needed to perform.</p>	<p>Annealing, case hardening, hardening and tempering.</p>	<p>Annealing of all metals during working. Heat treatment of mild steel and tool steel (HCS). Plastic memory. Steaming and bending times for timbers. Adhesive curing time and strengths.</p>
<p>5. Joining and assembly Those methods of fabricating and fitting together with the various parts of a job to form the desired structure, or give the required movement, to enable it to perform its task satisfactorily, both permanent and temporary.</p>	<p>Methods of frame and box (carcase) construction. Permanent and temporary fixtures. Fittings and adhesives.</p>	<p>Use of jigs, formers and holding devices to assist these methods. Later developments in use of fixing aids, particularly in 'newer' materials. Locking and pinning methods and friction fixings.</p>
<p>6. Finishing The preparation for, and application of, the surface treatment necessary for the material to perform its designed role most satisfactorily.</p>	<p>Surface finishes available, or made, to withstand both interior and exterior use.</p>	<p>Special finishes available to withstand corrosion, heat, liquids, stains, etc. Applied finishes as well as the role of 'as bought' finishes (oils, paints, lacquers, stains, dip-coating, satin polishes, etc.).</p>

2.4 Developing technologies

The developing technologies of structures, pneumatics, mechanisms, electronics, materials processing and micro-computing are increasingly being used in Design and Technology departments, as aids in graphics, design, control and realisation. Candidates should, whenever possible or appropriate, be given the opportunity to keep abreast of developments in these areas, both within school and industry, and to make use of that knowledge within their projects.

7. Project assessment

7.1 Organisation of assessment

- Teachers are not precluded from acting as advisers to their candidates.
- Candidates will not be penalised if working drawings show evidence of use.
- The teacher's assessment for both Part A and Part B should be made on a coursework assessment form which is at the end of this syllabus.
- It is expected that practical work will be completed by 15 October.
- Schools to be visited by examiners will be notified in good time.

Part A: Design folio

Part A is to be marked internally, with external moderation. The design folio must also contain sufficient photographs of the artefact, showing an overall view together with detailed views of evidence to support the award of marks for Part B (suitability of proposed solution, workmanship and evaluation).

Part B: Design artefact

Part B is also to be marked internally, using given criteria.

There will be external moderation by examiners.

Assessment of project

The criteria upon which the marking scheme will be built include:

- The extent of research and ability shown to use the material realistically in response to the problem being confronted.
- The appropriateness and quality of the techniques employed in the resolution of practical project work.

Assessment scheme

Part A: The design folio	Marks
General analysis of the topic	10
Formulation of design brief and specification	5
Exploration of ideas	10
Detailed development of proposed solution	15
Suitability of chosen materials and construction	10
Production planning	10
Communication	10
Total (Part A)	70

Part B: The artefact

Suitability of proposed solution	10
Workmanship	30
Evaluation	10
Total (Part B)	50
Total (Paper 2)	120

Internal moderation

When more than one teacher in a Centre is giving internal assessments, the Centre must make arrangements for all candidates to be assessed to a common standard.

External moderation for Centres in Mauritius

Moderators appointed by the Mauritius Examinations Syndicate, on behalf of Cambridge, will carry out external moderation of internal assessment. The Mauritius Examinations Syndicate will then send a representative sample to Cambridge, once in-country moderation is complete.

External moderation for all other Centres

Cambridge will carry out external moderation of internal assessment.

Centres must submit candidates' internally assessed marks to Cambridge. The deadlines and methods for submitting internally assessed marks and coursework samples are in the *Cambridge Administrative Guide* available on our website.

Coursework Assessment Summary Forms (a copy of which is at the back of this syllabus) must be enclosed with the coursework sample.

The sample of projects should consist of design folios in paper format no larger than A3 size. Each folio should include sufficient photographs showing an overall view and detailed evidence of the level of achievement reached on the final product. **Centres must not send Design artefacts themselves to Cambridge.**

Further information about external moderation may be found in the *Cambridge Handbook* and the *Cambridge Administrative Guide*.

All records and supporting written work should be retained until after the publication of the results.

7.2 Teachers' guide to assessment

The assessment is to reflect:

- (i) The extent of research and the ability to use the material realistically in response to the problem confronted.
- (ii) The appropriateness and quality of the techniques employed in the resolution of the practical project work.

The following guidance is given to teachers for making the assessment and completing the Cambridge form.

Part A: The design folio	
	Candidates should:
<i>General analysis of topic</i>	show, through a general examination of the theme, sensitivity to possible problems and the ability to analyse situations.
<i>Formulation of design brief and specification</i>	demonstrate the ability to define the problem, formulate a design brief and list a detailed specification.
<i>Exploration of ideas</i>	record the investigation made, and show an ability to explore a variety of existing and possible solutions.
<i>Detailed development of proposed solution</i>	show engagement in the development of ideas towards a working solution, which should be shown in the form of a working drawing.
<i>Suitability of chosen material(s) and construction</i>	show, through reasoned judgement, the ability to select materials, technologies and construction methods appropriate to the selected project.
<i>Production planning</i>	produce a plan setting out a sequence for the technical production of the artefact. The plan, which may be in the form of a flow chart or list, should identify and describe the more complex tasks.
<i>Communication</i>	have used appropriate techniques for achieving clarity of communication. These might include, for example, the use of colour, 'mock-ups' and models. An understanding of suitable drawing techniques, as revealed in the formal presentation of the final solution (assembly drawing, etc.). The use of words should be succinct.

Part B: The artefact	
	Candidates should:
<i>Suitability of proposed solution</i>	show that they have responded to the aesthetic and technical requirements of the design brief and specification.
<i>Workmanship</i>	demonstrate an ability to manipulate materials sensitively and apply technologies with accuracy of workmanship and quality of finish.
<i>Evaluation</i>	<p>write a succinct evaluation of the realised solution. The candidate should refer back to the requirements, originally specified, to assess how well the solution satisfies the brief. The evaluation should include:</p> <ul style="list-style-type: none"> (a) an assessment, based on objective testing, of how well the specification has been satisfied; (b) a reappraisal of the brief, including amendments to the brief, where appropriate; (c) comments on the modifications made as the project developed; (d) comments on any possible improvements that would improve the solution as made; (e) any effects brought about by the solution that were not foreseen.

7.3 Criteria for the assessment of the project

Part A: The design folio			
<i>General analysis of topic</i>	A wide ranging analysis with many aspects of the theme considered. A relatively sound analysis with a range of aspects of the theme considered. An analysis with aspects of the theme considered.	7–10 4–6 1–3	10
<i>Formulation of design brief and specification</i>	A concise brief with a comprehensive specification. A clear brief with a statement of some of the specific requirements. An unclear brief without relevant specification.	4–5 3 1–2	5
<i>Exploration of ideas</i>	A wide range of ideas combined with imaginative interpretation. A fair range of ideas with some ideas examined. Little variety of ideas with a tendency to misdirect efforts.	7–10 4–6 1–3	10
<i>Detailed development of proposed solution</i>	Thorough and thoughtful development with attention to fine detail. A developed idea with sufficient attention to detail only. An undeveloped idea lacking in attention to detail.	11–15 6–10 1–5	15
<i>Suitability of chosen materials and construction</i>	Deep knowledge well applied with reasoned selection of materials and construction. Adequate knowledge to recognise main options and make the necessary selection. Basic knowledge only. Considerable guidance needed in the selection of materials and methods of construction.	7–10 4–6 1–3	10
<i>Production planning</i>	Good insight to processes, clear detailed planning. Some anticipation and awareness of main processes. Adequate overall planning, but lacking in detail.	7–10 4–6 1–3	10
<i>Communication</i>	Clear. Competent graphic presentation but lacking in detail. Lacking both quality and detail.	7–10 4–6 1–3	10

Part B: The artefact			
<i>Suitability of proposed solution</i>	Good match to specification, refined aesthetic and technical features. Sound in most aspects and has some good features. Little match to main requirements of specification.	7–10 4–6 1–3	10
<i>Workmanship</i>	Overall judgement required, on how range of skills contained have been applied. Typically: Precise, accurate, well finished. Mastery of most aspects, refinement of detail. Competent, some minor inaccuracies, blemishes, some degree of mastery. Working product marred by limited skill control.	21–30 11–20 1–10	30
<i>Evaluation</i>	Detailed appraisal related to specification, objective, modifications proposed, tests applied where possible. Main aspects of specification critically appraised, some objectivity. General overall appraisal with little reference to specification.	7–10 4–6 1–3	10

8. Appendix

8.1 Coursework assessment summary form

Project assessment

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Instructions for completing Coursework Assessment Summary Forms

1. Complete the information at the head of the form.
2. List the candidates in an order which will allow ease of transfer of information to a computer-printed Coursework mark sheet at a later stage (i.e. in candidate index number order, where this is known).
3. Enter each candidate's marks on this form as follows:
 - (a) In the individual skills columns, enter the marks awarded.
 - (b) In the column headed 'Total Mark', enter the total mark awarded.
4. Ensure that the addition of marks is independently checked.
5. Both the teacher completing this form and the internal moderator should check the form and complete the bottom portion.

B. Procedures for external moderation in Mauritius

1. Cambridge International Examinations sends computer-printed Coursework mark sheets to the Mauritius Examinations Syndicate in early October showing the names and index numbers of each candidate.
2. External moderation of internal assessment will be carried out by moderators appointed by the Mauritius Examinations Syndicate on behalf of Cambridge.

The Mauritius Examinations Syndicate will communicate with Centres regarding procedures regarding external moderation and sampling.

It is the responsibility of the Mauritius Examinations Syndicate to ensure that the final moderated marks are recorded on the computer-printed Coursework mark sheets.

C. Procedures for external moderation in the rest of the world

Teachers should work with their exams officer to make sure the coursework samples are selected and submitted along with the supporting forms according to the instructions in the *Cambridge Administrative Guide*.

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9. Other information

Equality and inclusion

Cambridge International Examinations has taken great care in the preparation of this syllabus and assessment materials to avoid bias of any kind. To comply with the UK Equality Act (2010), Cambridge has designed this qualification with the aim of avoiding direct and indirect discrimination.

The standard assessment arrangements may present unnecessary barriers for candidates with disabilities or learning difficulties. Arrangements can be put in place for these candidates to enable them to access the assessments and receive recognition of their attainment. Access arrangements will not be agreed if they give candidates an unfair advantage over others or if they compromise the standards being assessed.

Candidates who are unable to access the assessment of any component may be eligible to receive an award based on the parts of the assessment they have taken.

Information on access arrangements is found in the *Cambridge Handbook* which can be downloaded from the website **www.cie.org.uk**

Language

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

Grading and reporting

Cambridge O Level results are shown by one of the grades A*, A, B, C, D or E, indicating the standard achieved, A* being the highest and E the lowest. 'Ungraded' indicates that the candidate's performance fell short of the standard required for grade E. 'Ungraded' will be reported on the statement of results but not on the certificate. The letters Q (result pending); X (no results) and Y (to be issued) may also appear on the statement of results but not on the certificate.

Entry codes

To maintain the security of our examinations we produce question papers for different areas of the world, known as 'administrative zones'. Where the component entry code has two digits, the first digit is the component number given in the syllabus. The second digit is the location code, specific to an administrative zone. Information about entry codes, examination timetables and administrative instructions can be found in the *Cambridge Guide to Making Entries*.

Cambridge International Examinations
1 Hills Road, Cambridge, CB1 2EU, United Kingdom
Tel: +44 (0)1223 553554 Fax: +44 (0)1223 553558
Email: info@cie.org.uk www.cie.org.uk

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