Singapore Examinations and Assessment Board

Singapore–Cambridge General Certificate of Education
Ordinary Level (2024)

Design Studies
(NP05)

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INTRODUCTION

The Design Studies syllabus is designed to equip students with the knowledge of the characteristics of the design field, design thinking, design process and fundamentals of three design disciplines. These include visual communication design, interior and exhibition space design, architectural design; and the skills to execute design tasks and projects. Design Studies emphasizes on good design, which is an optimization of factors pertaining to form and function.

AIMS

The following aims of the syllabus describe the educational intent of Design Studies. The aims are the major guiding influence in the syllabus implementation.

The aims of the syllabus are to:

- Nurture an awareness and appreciation of the positive relationship between design, humanity, art, technology, business, culture and economic development.
- Cultivate an interest in the field of design and nurture an informed awareness of the role of design in shaping one's experience of visual communication, space, objects and the environment.
- Develop an understanding of the principles of design thinking and user experience design, and the design process with respect to human, technical and business factors.
- Inculcate creative and innovative mind-sets, critical and inventive thinking skills, and global awareness through design activities.
- Nurture ability to critique design works and generate creative design solutions.
- Foster students' responsibility in decision-making, relationship management, confidence and positive attitude through design projects.
- Develop competency in visual expression, information management and communication, and digital design techniques for presenting design concepts.
- Develop capability in effective oral communication of design concepts.

ASSESSMENT OBJECTIVES

The assessment objectives in Design Studies are classified into three areas:

A. Design knowledge with understanding
B. Application of design knowledge
C. Design analysis and evaluation

The assessment objectives are designed to reflect the syllabus aims and to act as the reference against which the assessment will be made. Candidates will be required to:

A. DESIGN KNOWLEDGE WITH UNDERSTANDING

(1) Describe design criteria in human-centred design, iconic design works and design styles, and the principles of representative design fields.

(2) Identify the principles and approaches in design thinking.

(3) Explain the applications of the design elements, aesthetic principles, ergonomics and marketing.

B. APPLICATION OF DESIGN KNOWLEDGE

(4) Apply design research skills.

(5) Analyze research data and identify design strategies for concept generation.

(6) Apply design sketching skills in ideation, concept generation and detailed design.

(7) Use design software for presenting final design.

(8) Apply oral presentation skills in presenting design solution.

C. DESIGN ANALYSIS AND EVALUATION

(9) Analyze design research data and identify design strategies.

(10) Evaluate design ideas and concepts using design criteria.

(11) Analyze existing designs with respect to design knowledge.

SUBJECT CONTENT

Topic	Content	Learning Objectives
		At the end of the topic, students will be able to:
UNIT ONE: The Nature and Process of Design		
1.1 Design Process	(a) Purpose of Design	• Explain the fundamental aim of a design • List the benefits of a good design
	(b) Design Thinking	• Explain why a good design is the optimization of the human factors (form or desirability), technology factors (function or feasibility) and business factors (marketability or viability). • Explain why the human factors are the main consideration in design thinking • Explain the overall principles of User Experience Design and some of its basic strategic elements
	(c) Creative Thinking	• Identify barriers to creative thinking and ways to overcome the barriers. • Generate creative ideas using brainstorming and idea association technique
	(d) Design Phases	• List the phases of a generic design process • Explain the iterative nature of design process
	(e) Design Research	• Identify the design requirements from a Design Brief and carry out design research in terms of: problems and needs of target user groups and stakeholders • Identify Design Strategies
	(f) Concept Generation	• Generate and sketch design ideas with respect to the Design Strategies • Identify best design ideas and sketch design concepts
	(g) Concept Evaluation and Refinement	• Apply the SWOT (Strength, Weakness, Opportunity, Threat) method in analyzing and refining design concepts • Set criteria based on design strategies • Use the criteria to evaluate and select the best design concept
	(h) Detailed Design	• Sketch detailed layout design • Sketch part details and select components
	(i) Design Presentation & Communication	• Produce sketches, diagrams and other visuals to represent design concepts • Produce rendered views of design • Produce digital design presentation file using suitable software. • Communicate design through oral presentation

Topic	Content	Learning Objectives
1.2 Design History	(a) Design Movements	• Identify the characteristics of design movements, which include the Arts & Crafts Movement, Art Nouveau, Art Deco, Bauhaus, Modernism and Post-Modernism.
1.3 Design Factors	(a) Aesthetics: Elements and Principles of Design	• Explain the relevance of Elements and Principles of Design for the aesthetic quality of design • Apply the Elements and Principles of Design in design works
	(b) Aesthetics: Design Styles	• Identify the characteristics of different design styles, which include Asian Tropical, Modern and High-Tech • State the design styles used in existing design works • Apply appropriate design styles in design works
	(c) Ergonomics in Design	• Explain and apply the principles of ergonomics in design
UNIT TWO: Visual Communication Design		
2.1 Introduction to Visual Communication Design	(a) Fundamentals of Visual Communication Design	• Explain functions of Visual Communication Design, in communicating messages to a specific audience on products, events and information for business, social, cultural and political purposes.
	(b) The Process of Visual Communication Design	• Apply the process and phases of visual communication design
2.2 Visual Communication Design Principles	(a) Principles of Typography	• Describe the characteristics of fonts • Identify the various parts of a letter and understand the characteristics of a letter in order to be able to choose the right font
	(b) Colour Theory and Psychology	• Apply the principles of colour categories of the Colour Wheel • Explain the effects of colour on human emotion
	(c) Visual Harmony and Gestalt Principles	• Apply the principles of visual harmony and Gestalt in visual communication design
	(d) Layout and Detailing	• Apply grid system in layout design and balance in compositions
2.3 Visual Communication Representation	(a) Logo, Corporate Identity, Poster, and Packaging	• Apply the principles of visual communication design in the design of logo, corporate identity, poster, and packaging.
UNIT THREE: Interior and Exhibition Space Design		
3.1 Introduction to Interior and Exhibition Space Design	(a) Fundamentals of Interior and Exhibition Space Design	• Explain the functions of Interior and Exhibition Space Design, in planning of the interior spaces for residential living, commercial business and public events and interaction purposes.
	(b) The Process of Interior and	• Apply the process and phases of Interior and Exhibition Space Design

Topic	Content	Learning Objectives
	Exhibition Space Design	• Apply Client's Needs Analysis • Apply 3-dimensional Visualization using appropriate software to represent interior spaces. • Sketch one-point perspective views in interior design
3.2 Interior and Exhibition Space Design Principles and Applications	(a) Space	• Apply the principles on the use of interior and exhibition spatial volume, relationship and organization. • Apply Design Vocabulary in interior and exhibition space design
	(b) Furniture	• Select and design furniture for interior and exhibition space
	(c) Lighting	• Select and design lighting for interior and exhibition environment using the three different lighting schemes of General, Mood and Spot.
	(d) Materials	• Select suitable interior design materials considering functional and aesthetic requirements. • Apply Material Board in interior and exhibition space design.
	(e) Information and Interaction	• Apply the principles of information and interaction design for exhibition space
UNIT FOUR: Architectural Design		
4.1 Introduction to Architectural Design	(a) Fundamentals of Architectural Design	• Explain the functions of Architectural Design, in planning for the form, structure, materials and construction of a building for residential living, commercial business and public events and interaction purposes.
	(b) The Process of Architectural Design	• Apply the process and phases of Architectural Design • Apply Site Analysis • Apply Parti Diagrams and Bubble Diagrams to represent architectural design concepts • Sketch two-point perspective views • Apply drawing convention knowledge to generate architectural drawings, floor plans, sections and elevations of building
4.2 Architectural Design Principles and Applications	(a) Accessibility	• Design barrier-free accessibility for building
	(b) Sustainability	• Apply passive energy efficiency, renewable energy and active strategies
	(c) Aesthetics of Building	• Apply Ordering and Transformation Principles to achieve architectural aesthetics

SCHEME OF ASSESSMENT

Candidates will be required to sit for a written paper (Paper 1), as well as complete a design project (Paper 2) for the final assessment of the subject at GCE 'O' Level.

The assessment objectives are weighted to give an indication of their relative importance. They are not intended to provide a precise statement of the number of marks allocated to particular assessment objectives.

Paper	Requirement	Weighting	Duration of Paper	Assessment Objective Domains		
				Design Knowledge with Understanding	Application of Design Knowledge	Design Analysis and Evaluation
PAPER 1: Written Exam	Compulsory	40%	2.5 hours	10%	20%	10%
PAPER 2: Design Project	Compulsory	60%	30 hours (10 sessions x 3 hours)	-	50%	10%
			Total:	10%	70%	20%

Paper 1: Written Exam (40% of subject grade)

There are three compulsory sections in the paper:

Section A: 25% of total marks of Paper 1
Seven questions requiring short answers on basic knowledge and application of fundamental design concepts.

Section B: 50% of total marks of Paper 1
Seven questions on application of design principles which involve design analysis of given scenario.

Section C: 25% of total marks of Paper 1
Two questions that require interpretation of given information and synthesis of design knowledge and skills.

In every section, candidates are required to answer all questions.

Paper 2: Design Project (60% of subject grade)

Candidates will choose one out of three Design Briefs, and work individually to conceptualize and produce the design. At the end of the Design Project, candidates are required to submit a design journal, a digital design presentation file, and make an oral presentation of their design.

Candidates must attend a briefing conducted by the examining agency in Week 1 of Term 2 in the year of examination. At the briefing, candidates will be given the question paper. Thereafter candidates are required to carry out the design tasks according to the schedule and submission date, which will be given by the teacher supervisor.

At all times, the teacher supervisor will ensure the authenticity of the work done by each candidate. Throughout the Design Project, only candidates' work which is carried out in the class under the direct supervision of the teacher supervisor will be accepted for assessment grading of the Design Project. At the end of each project class, all candidates' hardcopy work will be placed in an A3 portfolio and locked up by the teacher supervisor and softcopy work will be saved into the school secured IT system. Candidates can gain access to their own works in the subsequent project class. In the last project class, all candidates will submit their completed portfolios in PDF format for the examination.

REQUIREMENTS AND ASSESSMENT OF DESIGN PROJECT

Scope of Design Project

The scope of the Design Project requires the candidates to apply the knowledge and skills learnt in Unit One, and either Unit Two, Three or Four depending on their choice of Design Brief. Candidates will be given three Design Briefs, based on the following fields of design:

1. Visual Communication Design
2. Interior and Exhibition Space Design
3. Architectural Design

Each student is required to select one Design Brief and produce a design with the following design phases:

- Research and identify Design Strategies,
- Sketch ideas and concepts,
- Evaluate and refine a concept,
- Develop detailed design,
- Produce a digital design presentation file for the final design,
- Make an oral presentation on their design.

Assessment Components

The assessment of the Design Project comprises three interrelated components:

Part A: Design Journal
Part B: Digital Design Presentation
Part C: Oral Presentation

Part A: Design Journal

The Design Journal is a compilation of all the design works done from initial design research to the final design. It should comprise A3 sheets or equivalent. The contents on the pages may take the form of notes, research materials, idea maps, idea thumbnails, concept sketches, calculations, tables, graphs, images, etc. At the end of the project, these pages are to be put together in the proper order for submission in PDF format. The following are to be included in the Design Journal:

- Research and Design Strategies
- Idea and Concept Generation
- Detailed Design Sketches

Part B: Digital Design Presentation

A digital design is produced for the final design using suitable software (e.g. Photoshop, Illustrator, Sketch-Up) learnt in the subject. Candidates then proceed to produce a digital presentation file (e.g. using Keynote or Powerpoint), which comprises the design strategies and the final design with the required views, drawings, and explanations on the final design in terms of optimization of the human factors (form or desirability), technology factors (function or feasibility) and business factors (marketability or viability). The digital presentation file must be submitted on a stipulated date before the Oral Presentation.

Part C: Oral Presentation

This comprises a 5-minute presentation followed by a 10-minute question-and-answer session. Candidates will use the digital presentation file from Part B for the Oral Presentation. Three examiners will be present as audience members for every candidate. In the question-and-answer session, the examiners will ask each candidate three questions which are scenario-based, to test the candidate's application of design principles in the project. The examiners will base the questions on each candidate's individual Design Journal and digital presentation file.

ASSESSMENT RUBRIC FOR PAPER 2: DESIGN PROJECT [Based on 100 marks]

Criterion	Max. Marks	Zero Mark	Level 1	Level 2	Level 3	Level 4
A. DESIGN JOURNAL [60 marks]						
(i) Design Research & Design Strategies	12	Criterion has not been met at all	1-3 marks Little research information gathered and used in Design Strategies	4-6 marks Some research with relevant information in Design Strategies	7-9 marks Sufficient research on main aspects of design project and utilization of information in Design-Strategies	10-12 marks Detailed research and utilization of information to produce the Design Strategies
(ii) Ideas & Concept Generation	12		1-3 marks Little evidence of concept generation with respect to the design requirements in Design Strategies	4-6 marks Aspects of concepts explored with some evidence according to the design requirements in Design Strategies	7-9 marks Concepts produced in some aspects key to the design requirements in Design-Strategies through thumbnails and annotated concept sketches.	10-12 marks Superior concepts generated closely according to the design requirements in Design-Strategies through thumbnails and annotated concept sketches.
(iii) Concept Evaluation & Refinement	8		1-2 marks Few explanations and improvements demonstrated in the concepts generated.	3-4 marks Some explanations on the concepts and how improvements are made in the refined sketch.	5-6 marks Key explanations of pros and cons of concepts and decision on selection are evident, and refined sketch shows relevant improvements.	7-8 marks Thorough explanations on the strengths and weaknesses of concepts generated and decision on the best concept, and good improvements shown in the refined sketch.
(iv) Detailed Design Sketches	10		1-2 marks Little evidence of details and development of the parts and whole design, leading to the final design in the presentation.	3-5 marks Sketches and explanations provide some necessary details in developing the concept, leading to the final design in the presentation.	6-7 marks Main details and explanations are given on the development for the parts and whole design with necessary views,-leading to the final design in the presentation.	8-10 marks Comprehensive details, explanations and excellent development design sketches providing very unambiguous illustrations for the parts and whole design with necessary views, leading to the final design in the presentation.
(v) Application of Design Principles	18		1-4 marks Little application of design principles learnt throughout the project.	5-9 marks Some evidence of application of design principles learnt throughout the project.	10-13 marks Evidence of a good application of design principles learnt throughout the project.	14-18 marks Evidence of a very high level of application of design principles learnt throughout the project.

Criterion	Max. Marks	Zero Mark	Level 1	Level 2	Level 3	Level 4
B. DIGITAL DESIGN PRESENTATION [28 marks]						
(i) Final Design Output	12	Criterion has not been met at all	1-3 marks The design output, i.e. diagrams, views and drawings, annotations and explanations, is of low quality, random, appears unplanned, lacks detail and cohesion.	4-6 marks The presented collection of diagram,-views, drawings, annotations and explanations is of discernible quality although there may be some gaps in the output consistency.	7-9 marks There is evidence of a cohesive group of diagrams, views, drawings, annotations and explanations that displays clear links between the whole design and its parts.	10-12 marks The contents of the final design output are highly detailed and integrated. There is evidence of very well organized work that led to the superior diagrams, views, drawings, annotations and explanations.
(ii) Quality of the Final Design	12		1-3 marks Little evidence that the users' needs given in the Design Brief are addressed, and the final design is very ordinary with few or no new features.	4-6 marks Some of the users' needs given in the Design Brief are fulfilled, and there is some attempt to make the final design differ from existing designs in terms of function and form.	7-9 marks There is evidence that most of the users' needs given in the Design Brief are dealt with in the final design solution that is fairly different from existing designs with new attributes.	10-12 marks The final design meets the users' needs given in the Design Brief to a very high degree, with clearly identified new features, and the design is highly novel and practical.
(iii) Effectiveness of Presentation Slides	4		1 mark The slides are lacking in content and clarity; they are unsystematic and poorly organized.	2 marks There is evidence of some systematic flow in the contents of the slides with the necessary information presented in a fairly clear manner.	3 marks The contents of the slides are quite complete, arranged in a logical way, and there is attempt to include creativity in them in order to attract the attention of the audience.	4 marks The slides are outstandingly organized, complete with the necessary information and are of very high clarity and creativity in presentation approach.
C. ORAL PRESENTATION [12 marks]						
(i) Quality of presentation to illustrate design process and design outcome	6	Criterion has not been met at all	1 mark The presentation lack relevance, clarity and elaboration.	2-3 marks Candidate shows some understanding of the design considerations, and the rigour and thinking in the project are limited.	4-5 marks The presentation is of good breadth and depth, and adequately describes the whole design process from design research to concept generation.	6 marks Candidate is able to effectively describe the whole design process from design research to concept generation in a very consistent manner, and is capable of clearly elaborating on ideas and decisions throughout the oral presentation.
ii) Quality of explanation at Q&A to demonstrate understanding of Design Thinking Principles	6		1 mark Candidate is barely able to explain the method and process of optimising human, technology and business factors.	2-3 marks The essentials and application of Design Thinking principles are explained but optimisation of related factors is not evident in the presentation.	4-5 marks Candidate is able to explain issues and answer questions related to Design Thinking principles most of the time, demonstrating a good understanding of the subject.	6 marks Explanations are consistently thorough. Covers all key methods and processes. Knowledge on optimization of human technology and business factors are very clearly articulated.