

**Hong Kong Diploma of Secondary Education Examination 2017**

**DESIGN AND APPLIED TECHNOLOGY**

**SBA Project – Suggested Titles**

Candidates are required to choose **ONE** project from the following:

**Project 1: An environmental friendly gourmet food truck for Hong Kong**

**Situation:**

Mobile food trucks serving delicacies in Hong Kong’s scenic locations allow visitors to enjoy the view while enjoying a meal and have the potential to become a new tourist attraction. Food trucks can also provide catering services at special events, such as carnivals.

A food truck (food van) is a vehicle designed to be mobile, and equipped to cook and sell food. Some food trucks prepare food from scratch on site, and offer gourmet cuisine and a variety of specialty menus.

**Design Problem:**

Design an attractive environmental friendly gourmet food truck for selling selected foods, which includes the interior and exterior of the vehicle. The truck should incorporate expandable parts which can be stretched outwards when it is open for business.

**Part 1 Research, investigation and data collection (10% of subject mark)**

**(a) Problem identification – exploring problems and clarifying tasks**

- Investigate and critically analyse some fast-food restaurants, with special attention to the organisation and layout of the kitchen, including methods and equipment related to food storage, food preparation, cooking, waste disposal and environmental protection.
- Study local fire, safety, health and hygiene regulations relating to operating a street food business.
- Investigate and analyse three types of vehicles suitable for converting into food trucks.
- Conduct a survey to collect the views from visitors and the general public about the variety of foods to be offered by food trucks in Hong Kong.
- Based on information collected from the survey and relevant local regulations and standards, prepare a design brief and a list of specifications which are design criteria that the proposed design solution must meet. The specifications should be justified against which ideas will be evaluated and the final design solution assessed.

**(b) Research in technology**

- Conduct a case study or technological exploration related to the design problem, e.g. a study on environmental protection in food truck design, a case study about ergonomic considerations for kitchen design, and an investigation on expanding features and mechanisms incorporated in food truck design.

**(c) Exploring preliminary design ideas**

- Draft a list of food to be sold. Estimate the equipment needed and the spaces required.
- Choose a suitable vehicle model for converting into a food truck and show its layout.
- Create a logo for the food truck, which will be used on the food packaging as well.
- Based on the requirements, use annotated sketches/prototypes/computer 3D models to generate three different initial ideas to show the interior and exterior design of the truck.

**Part 2 Design and make (30% of subject mark)**

**(a) Development and refinement of design ideas**

- Use annotated sketches/prototypes/computer 3D models to show the development and refinement of design ideas, with considerations on feasibility and alternative solutions.
- Use suitable media and format (engineering drawing/CAD) to produce assembly and working drawings (orthographic/pictorial/exploded view) of the proposed final solution, along with a parts list. The assembly and working drawings must have main measurements and constructional details.

**(b) Realisation of the final design solution**

- Apply appropriate technology, resources, planning and management skills to produce a 3D model (physical/virtual) of the proposed food truck, and using suitable and effective means to show the interior details of the truck.
- Prepare a time schedule that lists in each stage the time and resources required for the implementation of the final design solution.

**(c) Testing and evaluation of the final design solution**

- Formulate an evaluation plan, test and evaluate the final design solution against the requirements of the design brief. Identify the strengths of the design solution and areas for further improvement.

**(d) Overall presentation**

- Use an A4 or A3 size design folder to present the project proposal, management, development, realisation and evaluation processes and results.
- Use appropriate communication, modelling and information-processing skills and technical terminology for presenting research findings and design ideas.

## **Project 2: A piece of creative flat-pack manufactured board household furniture**

### **Situation:**

Flat-pack furniture facilitates storage, delivery and DIY assembly, and is quite practical and handy.

### **Design Problem:**

Design a piece of flat-pack household furniture. The furniture must be built from a single sheet of manufactured board available in the market. To be in line with the “zero waste” principle, parts of the furniture must be carefully designed and arranged on the board in order to minimize waste. You are also required to design packaging for the furniture, including graphic design and physical design, to encourage potential buyers to purchase the product.

### **Part 1 Research, investigation and data collection (10% of subject mark)**

#### **(a) Problem identification – exploring problems and clarifying tasks**

- Investigate and critically analyse existing flat-pack furniture in terms of function, aesthetics, structure, safety, material, surface finish, manufacture, and packaging.
- Conduct a new product development customer survey to collect data from potential customers about their views on flat-pack furniture for the Hong Kong context.
- Based on information collected from the survey, prepare a design brief and a list of specifications which are design criteria that the proposed design solution must meet. The specifications should be justified against which ideas will be evaluated and the final design solution assessed.

#### **(b) Research in technology**

- Conduct a case study or technological exploration related to the design problem, e.g. a case study on “zero waste” furniture design and manufacture strategies, an investigation on manufactured boards used for flat-pack furniture, ergonomic considerations for furniture design, and a study on methods of wrapping furniture or products. The focus is on construction, packaging materials, colours and graphic design.

#### **(c) Exploring preliminary design ideas**

- Use annotated sketches/prototypes/computer 3D models to generate three different initial ideas with detailed notes showing function, aesthetics, structure, safety, material, surface finish, manufacture and packaging of the proposed flat-pack furniture.

## **Part 2 Design and make (30% of subject mark)**

### **(a) Development and refinement of design ideas**

- Use annotated sketches/prototypes/computer 3D models to show the development and refinement of design ideas, with considerations on feasibility and alternative solutions.
- Use suitable media and format (engineering drawing/CAD) to produce assembly and working drawings (orthographic/pictorial/exploded view) of the proposed final solution, along with a parts list. The assembly and working drawings must have main measurements and constructional details.

### **(b) Realisation of the final design solution**

- Apply appropriate technology, resources, planning and management skills to produce a 3D model (physical/virtual) of the proposed flat-pack furniture and packaging, together with assembly instruction sheet or computer animation.
- Prepare a time schedule that lists in each stage the time and resources required for the implementation of the final design solution.

### **(c) Testing and evaluation of the final design solution**

- Formulate an evaluation plan, test and evaluate the final design solution against the requirements of the design brief. Identify the strengths of the design solution and areas for further improvement.
- Use an appropriate method to assess the “material utilization” for the production of the design solution, in order to illustrate the extent of materials to be used effectively.

### **(d) Overall presentation**

- Use an A4 or A3 size design folder to present the project proposal, management, development, realisation and evaluation processes and results.
- Use appropriate communication, modelling and information-processing skills, and technical terminology for presenting research findings and design ideas.

### **Project 3: A set of innovative outdoor play equipment for 6 to 12-year-old children**

#### **Situation:**

Play is an essential part of children's growth and development as it contributes to a child's physical and mental well-being. Outdoor playgrounds can offer a variety of challenges and valuable experiences to children. Age appropriate play equipment should be designed for different age groups of children to stimulate and encourage them to develop new skills.

#### **Design problem:**

Design a set of play equipment with 5 functions in a selected outdoor playground, for developing the cognitive / physical / social / emotional well-being of 6 to 12-year-old children.

#### **Part 1 Research, investigation and data collection (10% of subject mark)**

##### **(a) Problem identification – exploring problems and clarifying tasks**

- Conduct a site analysis of an outdoor playground by investigating and analysing existing play facilities appropriate for 6 to 12-year-old children, in terms of: play value, safety, supervision, sanitation, challenge, structure, size, material, surfacing and maintenance.
- Conduct a user opinion survey to collect opinions from parents and age appropriate children about their views on desirable play facilities to be installed in the proposed venue.
- Based on information collected in the site analysis, the user opinion survey and relevant guidelines, regulations and standards, prepare a design brief and a list of specifications which are design criteria that the proposed design solution must meet. The specifications should be justified against which ideas will be evaluated and the final design solution assessed.

##### **(b) Research in technology**

- Conduct a case study or technological exploration related to the design problem, e.g. an investigation on ways in which tubular materials can be joined together, ergonomic considerations for children-play-facilities' design.

##### **(c) Exploring preliminary design ideas**

- Use annotated sketches/prototypes/computer 3D models to generate three different initial ideas to show the site layout and play equipment, including shape, size, colour, material, construction, manufacture and cost.

## **Part 2 Design and make (30% of subject mark)**

### **(a) Development and refinement of design ideas**

- Use annotated sketches/prototypes/computer 3D models to show the development and refinement of design ideas, with considerations on feasibility and alternative solutions.
- Use suitable media and format (engineering drawing/CAD) to produce assembly and working drawings (orthographic/pictorial/exploded view) of the proposed final solution, along with a parts list. The assembly and working drawings must have main measurements and constructional details.

### **(b) Realisation of the final design solution**

- Apply appropriate technology, resources, planning and management skills to produce a 3D model (physical/virtual) of the proposed play equipment and play space. Use appropriate and effective means to show hidden constructional details of the play equipment.
- Design an illustrated user guide to be displayed near the play facility, which describes proper ways of using the facility.
- Prepare a time schedule that lists in each stage the time and resources required for the implementation of the final design solution.

### **(c) Testing and evaluation of the final design solution**

- Formulate an evaluation plan, test and evaluate the final design solution against the requirements of the design brief. Identify the strengths of the design solution and areas for further improvement.

### **(d) Overall presentation**

- Use an A4 or A3 size design folder to present the project proposal, management, development, realisation and evaluation processes and results.
- Use appropriate communication, modelling and information-processing skills, and technical terminology for presenting research findings and design ideas.

### **Remarks:**

**The HKDSE Examination Regulations stipulate that a candidate may be liable to disqualification from part or the whole of the Examination or suffer a mark or grade penalty for breaching the regulations. For details, please refer to the SBA Teachers' Handbook for Design and Applied Technology:**

[http://www.hkeaa.edu.hk/en/sba/sub\\_info\\_sba/dse\\_subject.html?10](http://www.hkeaa.edu.hk/en/sba/sub_info_sba/dse_subject.html?10)