8.0 Module 8

Design Thinking Process Project: Product Design Collaborative Enterprise Start-up Project

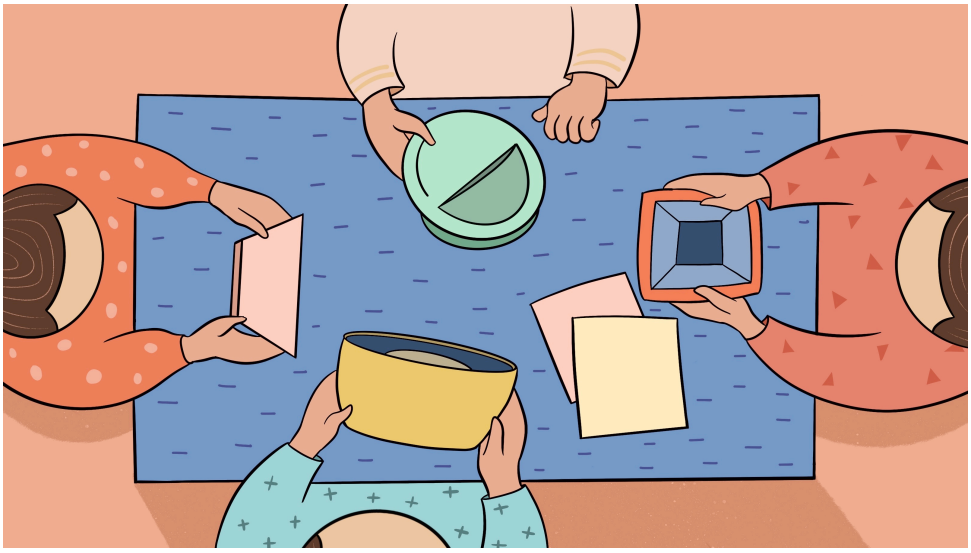
27 hours (18 in school and 9 at home)

Exposure 1	- Introduction to Design Thinking Process for product Design
Exposure 2	- Introduction to analysis of products features
Exposure 3	- Case study of a project in product Design
Overall Task	**Design of Smart Everyday Objects + an Enterprise Start-up**
Task 8.1 (at School + Home)	- Understanding the problem to be solved – Primary and Secondary Research
Task 8.2 (at School + Home)	- Analysis of the problem
Task 8.3 (at School + Home)	- Ideating, sketching and alternatives
Task 8.4 (at School + Home)	- Creating prototypes
Task 8.5 (at School)	- Business Model
Task 8.6 and Final Output	- Final Design Solution Presentation and Documentation + Reflections, Self Assessment and References

8.0 **Module 8**

Design Project: Product Design Collaborative Enterprise Start-up Project

(18 hours at school + 9 hours at home)



Introduction

This module introduces the students to the different stages of the design thinking process for solving a Product Design problem.
The students get to design different aspects of the product looking at its form, function, configuration, material, technology, etc.
The students are encouraged to make use of their learning from the previous modules on Product Design and Interface Design to solve this problem.

Aim of this Module

This design project will introduce students to the different stages of the design thinking process while solving a product design problem. The students would use the following process: observe, understand, ideate, build/do and test or reflect.

This design project will also have students working collaboratively together to start an enterprise with the product that they conceive. The students will need to put together a business plan and make a pitch presentation for their final design solution.

Place:

Place: Task 8.1, 8.2, 8.3, 8.4, and 8.5 done at School and at home

Grouping:

Grouping: Class tasks are done in groups of 3-4 and Home tasks are individually

Equipment:	**Equipment:** Sketchbooks for sketching and taking notes. students may use digital devices like computers or tablets to collate information and make presentations (if available, but not necessary)
Exposures	**Exposure1:** Introduction to Design Thinking Process for product Design **Exposure 2:** Introduction to analysis of products features **Exposure 3:** Case study of a project in product Design
Design Thinking & Innovation Process involvement:	This task involves the following phases of the DT&I Process: Phase 1. Observe/Empathise/Research (Primary and Secondary Research) Phase 2. Understand/Analyse/Define (Analysis of Findings) Phase 3. Ideate/Alternate/Create (trying creative alternatives) Phase 4. Build/Prototype/Detail (making the prototype and the presentation) Phase 5. Evaluate/Reflect/Implement (feedback from others)
Mapping SDG Goals:	The following SDG goals need to be considered while solving this task. While documenting elements and expressions, do think of gender equality and reduced inequalities and concern for life on our planet. 

Task 8:

Task 8 = 8.1 + 8.2 + 8.3 + 8.4
School Hours: 27, Home hours: 9

Task 8:

Overall Task (Task 8.1 + Task 8.2 + Task 8.3 + Task 8.4):

Task Topic:

Design Project:
Product Design Collaborative
Enterprise Start-up Project

Theme:

Design of a Smart Everyday Product:

By combining smart technologies (sensors, displays, connectivity, data) with products can increase the functionality of the product to bring in convenience, flexibility, personalization, remote operation, energy-efficient, etc.
Inputs from the previous modules on Product Design and Interface Design will help you solve this problem.

Common examples are the smart lighting, Smart Traffic lights, Smart fridges, etc. The concept of smartness has also been extended to Smart Homes, Smart Schools, Smart Factories, Smart Streets, Smart Cities, Smart Vehicles, etc.

You can choose any of these products and ideate how their functions could be improved and enhanced by integrating with smart technologies:
a. Bicycle – navigation, lighting, etc.
b. School Bag – Storage indicator, reminder, etc.
c. Main Door – security, identity, etc.
d. Wallet – accounting, expenditure, etc.
e. Books – Highlighting, summary, etc.
f. Mirror – reminder, etc.
g. Any other product of your choice

The Challenge:
- is to choose an everyday simple product and integrate it with the required smart features to extend its usage and purpose.
- the process includes the following: research, understand needs, analyse requirements, ideate alternate solutions, finalise and build prototypes, get feedback, formulate a business plan and make a pitch presentation.

The students work in groups of 3-4, both collaboratively and co-operatively together. They share the workload and are partner team members in solving the different stages of the problem.

Task 8.1

Task 8.1 = 8.1a + 8.1b + 8.1c
School Hours: 4, done collaboratively in groups of 3-4, and Home hours 2, done individually

Topic title:

Defining the Problem to be solved:

Design of a Smart Everyday Product

Task 8.1a: Make Selections and Ask Questions

School Hours: 1, done collaboratively in groups of 3-4

1. Select the product that you would like to design for this project
2. Investigate smart technologies that you may find useful for the project
3. Ask the following questions about the above the object
- What? Why? How? Whom? Where? When? etc.
4. Make sketches about the chosen existing object from different viewpoints

Task 8.1b: Secondary Research

Home hours 2, done individually

Secondary research as the name indicates is collection of information from secondary resources. These could be from books, publications, newspapers, talking to experts and the internet. As someone else has written or spoken about the subject, you need to keep note down the reference details.
1. Understand your chosen product and its components. You could make a mid-map of the product and its connections
2. Compare it with similar products and try to find out its advantages and disadvantages
3. Search for information on a media that is accessible to you. Take down notes as points. Mark important aspects
Output 8.1b: Collate the information involving images and short text in form of a report or slides (around 4 to 6 pages or slides)

Task 8.1c: Primary Research

School Hours: 3, done collaboratively in groups of 3-4

The Primary research involves the following:
1. Identify all the users - primary and secondary users who interact with the product
2. Converse with the people involved with this activity to get a better understanding (take down notes), try to understand the product use from the user's point of view (empathize with the user)
3.Understand how the object is used (document these),
4. Document through photography or sketching the different aspects of the problem being solved
5. Collate all the information and order it according to priority/importance
6. Identify issues or problem areas that can be solved
Output 8.1c: Make a presentation involving images and short text in form of a report or slides (around 4 to 6 pages or slides)

Task 8.2

Task 8.2 = 8.2a + 8.2b
School Hours: 4
Done in groups of 3-4 at School and individually at Home

Task Title:

Analysing the problem to be solved:

Task 8.2a: Information Analysis (classification and affinities)

School hours: 4, done collaboratively in groups of 3-4

1.Summarize information from primary research as points and write this on separate sticky notes. These are your **observations**.
2. Classify the sticky notes related in some way into different categories (some may fit in multiple categories so replicate them)
3. Priorities the sticky notes within the categories according to their importance
4. Find connections (affinities) between the sticky notes and these are your **inferences and insights** from your study
5. Begin discussion within your group on the relevance of these inferences and see if they provide or indicate **opportunities for design** intervention to solve some of the problems
Output 8.2a: Make a chart of classifying the information collected according to the following:

Observations	Inferences/Insights	Design Opportunities
1.		
2.		

Task 8.2b: Make (a) Journey/Sequence Map of the activities

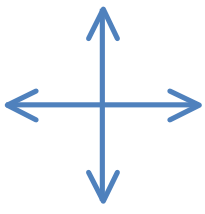
Home hours: 2, done individually
1. List all the activities that are required for the mobile facility/service
2. Make the sequence in which the different activities need to be done
3. Note down the space requirements for each of these activities
Output 8.2b: Make a sequence map of the activities mapping it on the space available on the mobile vehicle

Task 8.3

Task 8.3
School hours: 6 and Home hours: 2
Done in groups of 3-4 at School and individually at Home

Topic title:

Ideation on Creative Innovative Design Solution Possibilities + Shortlisting of Ideas



- Ideate on possible solutions by sketching these
1. Your group could brainstorm, Ideate on possible creative innovative solutions and sketch these out + number or name these ideas
2. Make a list of possible solutions on this matrix of (easy to implement vs difficult to implement on the horizontal axis and low product idea vs great product idea on the vertical axis)

3. Collate all the good ideas together and short-list them according to their product effectiveness and ease of implementation
Output 8.3: Make a presentation of these in 3 slides (alternate sketches + Matrix + short-listed idea)

Task 8.4

Task 8.4
School hours: 6 and Home hours: 2
Done in groups of 3-4 at School and individually at Home

Topic title:

Design Solution Mock-ups + Prototyping

1. Select the best one out of your ideation and finalise it with details.
2. The final concept could involve any of the following:
- 2D/3D design Sketches + Physical Prototyping + Visualisation + 3D Models
3. Detail out the final selected solution: the details could be about its layout, form, colours, material selection, the listing of advantages/disadvantages and how to produce
3. Make a mock-up of your final idea – a scaled version
4. Show the mock-up to potential users and get feedback
5. Incorporate suggestions from the feedback in your design
6. Make the final prototype
Output 8.4: Make a presentation of these in 3 slides (mock-up + feedback + details)

Task 8.5

Task 8.5
School hours: 2
Done in groups of 3-4 at School

Topic title:

Business Model

Prepare a Business Model for the product to be made into an enterprise with a start-up as the beginning.
1. Use the following Business Model template to fill in the details
a. Key Partners of the Enterprise
b. Key activities of the Enterprise
c. Key resources for the Enterprise
d. Value of Product delivered to customer
f. Customer segment
g. Revenue Model of the Enterprise
2. Make use of these points to make a business model for your design enterprise (where you have to present the business viability of the new product)

Output 8.6: A Business Model for your enterprise in 2 slides

Task 8.6

Task 8.6
School hours: 4 and Home hours: 2
Done in groups of 3-4 at School and individually at Home

Topic title:

Design + Business Solution Final Presentation and Documentation

Prepare a presentation (of 6-10 minutes duration) to include all the stages of your project:

a. Title of the System Design Project or Problem Statement
b. Team members
c. Summary/content listing of your presentation
d. Insights from Primary and Secondary Research
e. Major design opportunities
f. Restatement of the problem / Design Objectives / Design Goals
g. Alternate Concepts (sketches + quick scenarios + concept models)
h. Final Concept and its unique features
i. Process, Form or Interface development and detailing
j. Prototype /Mock-up (optional)
k. User feedback on your final solution
l. Business model for your design enterprise
m. Future steps and suggestions
n. Full References (Learn how to do references)
o. Acknowledgments – to all who have helped

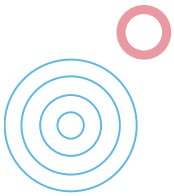
Output 8.6: A pitch presentation (10 minutes, roughly 20 to 30 slides) explaining the business model, design process and the final solution

Reflection:

Questions to ponder:

- What are the most interesting methods of the Design Thinking process that you found useful in solving the above problem?
- Can you apply what you learnt by redesigning products and artifacts around your home and neighbourhood to make them better?
- Will you collaborate and make use of the Design Thinking Process with others – like your friends and cousins to solve problems?

Assessment:



Assessment Criteria (Task 8.1 + 8.2 + 8.3 + 8.4 + 8.5 + 8.6) - Assess yourself:

- Identifies the key issues and has a good understanding of the problem area based on secondary and primary research (Group + individual task 8.1)

☐ *Beginning* ☐ *Developing* ☐ *Promising* ☐ *Proficient* ☐ *Excellent*

- Analysis of the problem was done well with proper categorisation and assigning priorities. (Group + individual task 8.2)

☐ *Beginning* ☐ *Developing* ☐ *Promising* ☐ *Proficient* ☐ *Excellent*

- Comes out with creative innovative several alternate ideas along with sketches (Group + individual task 8.3)

☐ *Beginning* ☐ *Developing* ☐ *Promising* ☐ *Proficient* ☐ *Excellent*

- The mock-up of the prototype of the final concept was done well +incorporating feedback from the users (Group + individual task 8.4)

☐ *Beginning* ☐ *Developing* ☐ *Promising* ☐ *Proficient* ☐ *Excellent*

- The students put together a viable business model for their design enterprise (Group task 8.5)

☐ *Beginning* ☐ *Developing* ☐ *Promising* ☐ *Proficient* ☐ *Excellent*

- The final presentation showing the business model, design process and the final solution was done well (Group + Individual task 8.6)

☐ *Beginning* ☐ *Developing* ☐ *Promising* ☐ *Proficient* ☐ *Excellent*

Other References:

Other suggested References:

1. Design Enterprise Project
https://www.dsource.in/course/collaborative-design-enterprise-project