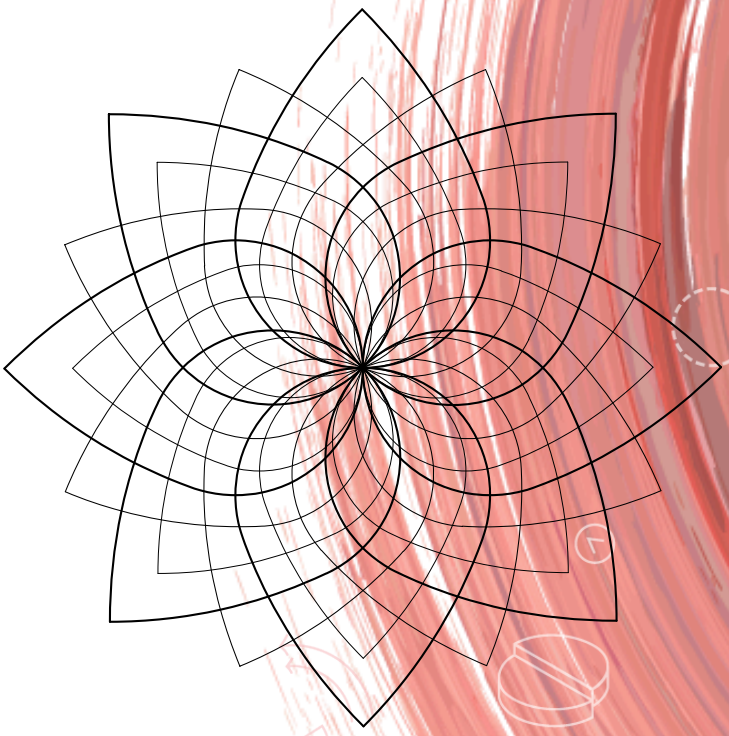
Design Thinking and Innovation

for Grade 12, Semester 1 and 2

Taskbook

2022



Task-book

CBSE, New Delhi

Design Thinking and Innovation Curriculum Grade 12

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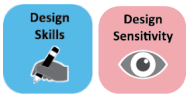
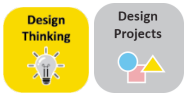
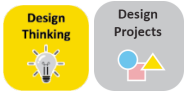
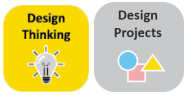
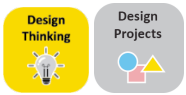
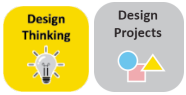
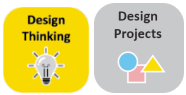
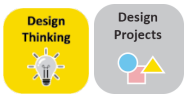
1.0		Introduction to Indian Knowledge Systems	20 hours	20 credits	7
2.0		Design for Personal Space	20 hours	20 credits	17
3.0		Design for Social Space	20 hours	20 credits	26
4.0		Design for Public Space	20 hours	20 credits	35
5.0		Capstone Final Design Project Stage 1 – Observations and Analysis	20 hours	20 Credits	48
6.0		Capstone Final Design Project Stage 2 – Ideation and Alternate Solutions	20 hours	20 Credits	51
7.0		Capstone Final Design Project Stage 3 – Prototyping and Feedback	20 hours	20 credits	53
8.0		Capstone Final Design Project Stage 4 – Presentation and Documentation	20 hours	20 credits	55
9.0		Assessment + Feedback Forms			60
10.0		Acknowledgements + Credits			71
		Total Hours and Credits	160 hours	160 credits	

Design Thinking and Innovation Task-book for Grade 12

Introduction:

0.1.1
What is Design?

"Design is solution to a problem"
-John Maeda, Designer and Teacher

"Essentials of design are- purity, precision, details "
-Prof Sudhakar Nadkarni, Designer and Teacher

"Design is thinking made visual"
-Saul Bass, Graphic Designer

"Design is plan for arranging elements in such a way
-Charles Eames, Designer and Film Maker

"Design is not just what it looks like and feels like.
Design is how it works."
-Steve Jobs, Designer and Businessman

In a nutshell, design is about understanding needs and being sensitive to issues, identifying problems that need to be solved, creating innovative appropriate solutions, and considering aspects of sustainability such that it makes a positive difference to life in our universe.

0.1.2
Who is a Designer?

A designer is a highly creative person who enjoys solving problems. The reason why they enjoy being creative is that they are sensitive to the needs of people and understand the extent of the issues in society. This sensitivity allows a designer to be intuitive and to think of opportunities that enhance the lives of people. It makes them appreciate the intricate aspects of a problem or a situation to help better it through creative designs. (Ref: 2)
Design being an important part of the creative industry has many options for you to pursue, such as Communication/Graphic Design, Product Design, Animation Design, Automobile Design, Architecture Design, Environmental Design, Digital Design, Textile/Fashion Design, and such.
So, if you are looking for something which will give your creative streak in you an outlet and also provide you with innovative problem-solving skills, design may be the option for you.

0.1.3
What is Design Thinking?

One can understand Design Thinking as a method to solve problems using a process. It is one of the most effective ways to create something new.
A process that first understands users, identifies and analyses a problem or need, and researches relevant information, after which ideas are explored and analyzed, until an appropriate innovative solution to the problem or need is arrived at.

Hence Design Thinking could be viewed as the process that translates an idea into a blueprint for something useful, whether it's a vehicle, a building, a graphic, a service or a system. (Ref: 2)

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0.1.4

Who is a Design Thinker?

A Design Thinker is a person who applies the Design Thinking process to solve problems and find creative innovative solutions in any field or domain. For example, you could apply Design Thinking to solve problems in arts, social sciences, law, medicine, engineering, business, etc. It could even be applied to solve problems at home or in your neighbourhood or in your place of work. Whether it is a simple problem or a complex problem, a design thinker finds creative ways to tackle them.
If everyone could adopt this method to solve problems then we would be moving towards a creative society that finds solutions to many of its problems.

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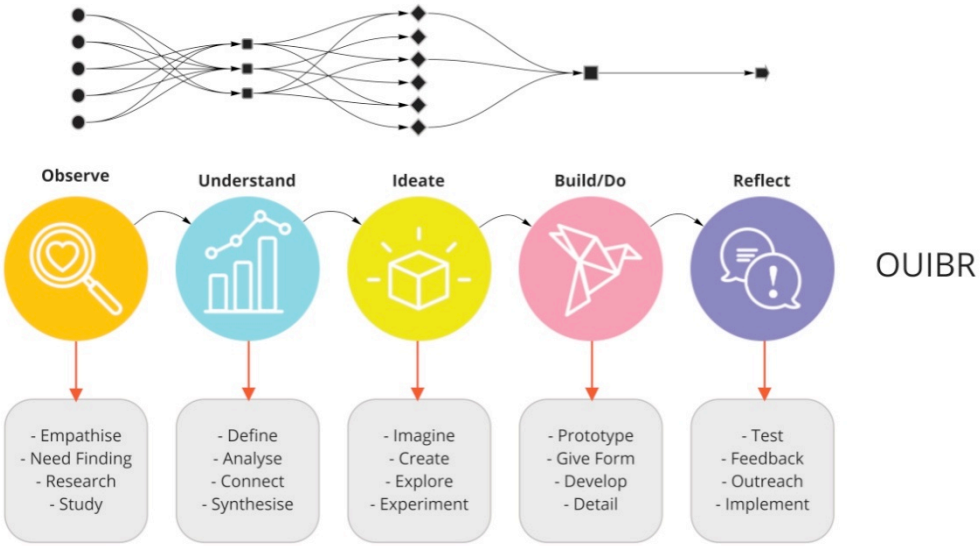
0.1.5

What is the Design Thinking Process?

It involves the following five phases in the process of solving a problem:
Phase 1. Observe/Empathise/Research,
- The first phase helps you to identify needs and locate issues to be solved through observation and empathy
Phase 2. Understand/Analyse/Define,
- The second phase of the process helps you to understand, define and analyse the problem area
Phase 3. Ideate/Alternate/Create,
- The third phase helps you to come out with several alternate creative innovative solutions to the problem
Phase 4. Build/Prototype/Detail and
- The fourth phase helps you to actualize the solution by building mock-ups, creating scenarios, and then prototyping and detailing
Phase 5. Reflect/Feedback/Implement
- The last fifth phase is to get feedback through evaluation so that the suggestions can be implemented in the final solution.



1.1.6

What is Innovation?

Innovation involves the implementation of something new and replacing or reframing the existing mindset. It is about translating a concept, idea, thought, or invention into artefacts and services that create value in life. It is the process of transforming ideas into commercial reality. Innovation plays a major role in society. It helps us cater to the needs of people that arise from constant physical and emotional changes. It helps identify the crucial applications of technology and scientific inventions.

As compared to Innovation, Invention happens once in a while. However, each Invention may produce millions of Innovative Products – like the invention of Wheel has produced and continues to produce Innovative Products for the benefit of mankind. Innovation is in how an invention can be used to solve problems. Hence, Design pursues Creativity of Innovation.

1.1.7

What is the overall vision and aims of Design Thinking and innovation Curriculum?

The overall vision of DT&I curriculum is to be able to instill the following in the students:

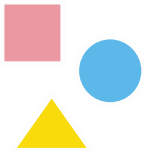
• Explore student's **sensory** abilities, **cognitive** abilities and **social** abilities

• Create awareness in the students through **observation**, **discovery**, **analysis**, **experience**, **collaboration** and **reflection**

• Nurture their **curiosity** and enhance their **explorative** abilities

• Foster **creativity** and **innovation** in students

• Identify **problems** and be able to find **solutions** + Apply **Design Thinking** process and methods to **solve** various **problems**



• Learn the fundamentals/essentials of the **creative design discipline**

In addition, DT&I will promote socially responsible practice through enlightening the students with ways to solve problems within the Sustainable Development Goals as mentioned by the United Nations. The course also helps students derive culturally-rooted understanding of design from information documented under the Indian Knowledge Systems.

References:

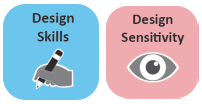
Reference 1: https://dsource.in/resource/quotes
Reference 2: http://designindia.net/institutions/design-information/design-questions

Design Thinking and Innovation Task-book for Grade 12

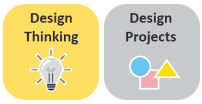
Overview:

0.2
Modules for Grade 12

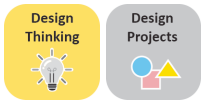
Semester 1



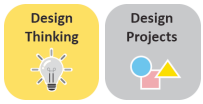
Introduction to Indian Knowledge Systems



Design for Personal Space

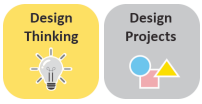


Design for Social Space

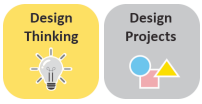


Design for Public Space

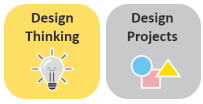
Semester 2



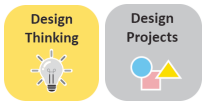
Capstone Final Design Project Stage 1



Capstone Final Design Project Stage 2



Capstone Final Design Project Stage 3



Capstone Final Design Project Stage 4

0.3
Overall Vision for Grade 12

- Understanding of Indian Knowledge Systems
- Create sensitivity towards Design
- Apply of Design Thinking Process in a range of projects
- Ability to solve problems collaboratively together

0.4
Overall Learning Objectives

- Design for Personal Spaces, Social Spaces and Public Spaces
- Application of Indian Knowledge Systems to solving problems
- Application of Design Thinking Process through Collaborative Projects
- Application of Design Principles and Thinking Process through a semester long Capstone Project

0.5
Additional Competencies

- Enhance Observation and Analytical Skills
- Develop Concerns for Design Issues
- Become more confident in solving a range of problems

0.6
Matching SDG Goals

Design Thinking and Innovation Task-book for Grade 12

Overview:

0.7
Grading

Grade Awarded	Grade	Points
Outstanding	O!	1.0 (or Extra Points)
Above Excellent	AA	1.0
Excellent	AB	0.9
Above Proficient	BB	0.8
Proficient	BC	0.7
Above Promising	CC	0.6
Promising	CD	0.5
Above Developing	DD	0.4
Developing	DE	0.3
Above Beginning	EE	0.2
Beginning	EF	0.1

0.8
Assessment

- Define the criteria for assessment for this Module
(mentioning the factors for grading/assessment preferably on a Matrix)

Beginning FF-EF-EE 0.0-0.1-0.2	Developing DE-DD 0.3-0.4	Promising CD-CC 0.5-0.6	Proficient BC-BB 0.7-0.8	Excellent AB-AA 0.9-1.0
Criteria 1	Criteria 1	Criteria 1	Criteria 1	Criteria 1
. . . .	Criteria 2	Criteria 2	Criteria 2	Criteria 2
. . . .	. . . .	Criteria 3	Criteria 3	Criteria 3
. . . .	. . . .	. . . .	. . . .	. . . .
			. . . .	. . . .

Final Credits for this Module = Grade x Credits

0.9
Validation/Feedback

- The task done needs to be validated with feedback from both students as well as teachers (so that this can become an input for making changes in the next year)

0.10
References

- References are mentioned at the end of each task
- As much as possible, these should be made accessible to both students and teachers

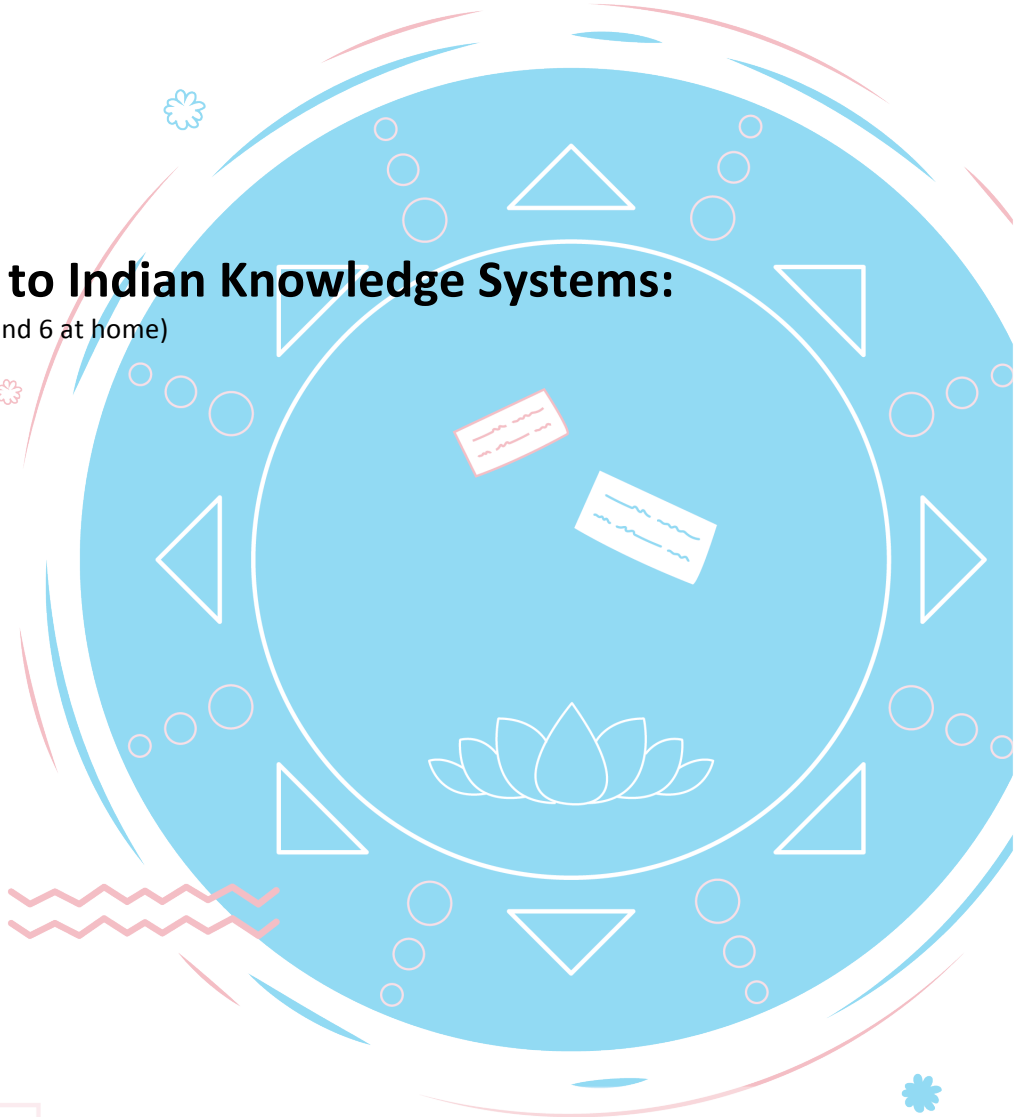
0.11
Exhibition/Presentation

- As most of the design tasks have a visual output, the class is encouraged to put up the tasks as an exhibition (for a short period) in the classroom / in common areas of the school or as a group presentation for others in the school to see.

1.0 **Module 1**

Introduction to Indian Knowledge Systems:

20 hours (14 in school and 6 at home)



Design Skills

Design Sensitivity

Exposure 1	- Introduction to Indian Knowledge Systems
Exposure 2	- Abstraction, Metaphors and Giving Form
Exposure 3	- Mapping of Elements of Nature
Exposure 4	- Grids and Composition, Grids and Patterns
Task 1.1 (at School + Home)	- Abstraction, Metaphors and Giving Form
Task 1.2 (at School + Home)	- Mapping of Elements of Design
Task 1.3 (at School + Home)	- Design a Story Book for Children
Task 1.4 (at School + Home)	- Grids and Composition
Final Output	- Grids and Patterns, Grids and Fractal Patterns
	+ Reflections, Self Assessment and References

1.0 Module 1

Introduction to Indian Knowledge Systems:

20 hours (14 in school and 6 at home)

Introduction

Indian Knowledge Systems use the ancient and indigenous knowledge of India to arrive at principles and techniques that are timeless, unique, and based on centuries of work. While the meticulously detailed temples with their mathematical grids are awe inspiring, the simple and innovative design solutions and techniques encountered in the rural and urban 'wilds' of India are genuinely surprising and inspiring.

The Eastern tradition, in India gave rise to a design process where the object emerged as a result of giving Form to Ideas. Indian design process aims to give Form to the Formless. The Formless is an abstract principle/phenomenon, for which an Image is created to express the qualities and attributes of that phenomenon.

The different tasks in this module are based on understanding these principles.

Aim of the Module

The aim of this module is to introduce the richness of Indian Knowledge systems. It has direct applications in the filed of design and this module attempts to make the students aware of these possibilities.

The following aspects will be covered during this module:

1. Identify and explore the meanings of abstraction, symbolism and storytelling using principles from ancient Indian arts and design.
2. Familiarising with and following the classical Indian Design Process to give meaning to the abstract, converting formless ideas into form.
3. Learning abstraction-using mapping of various design elements to the human body and elements found in nature.
4. Understand the human body using anthropometric measurements, ratios and movements from classical arts to create universal designs.
5. Learn the importance and application of different types of grids in design and architecture.
6. Explore recursive procedures like fractals to detail forms in design using examples from traditional Indian arts and nature.

Place:

Place: Task 1.1, Task 1.2, Task 1.3 – done at both school and at home

Equipment:

Equipment: Sketchbooks for sketching, Stationary (Pencils, Pens, Colours, Tracing paper), students are advised to use digital devices like computers or tablets (if available, but not necessary)

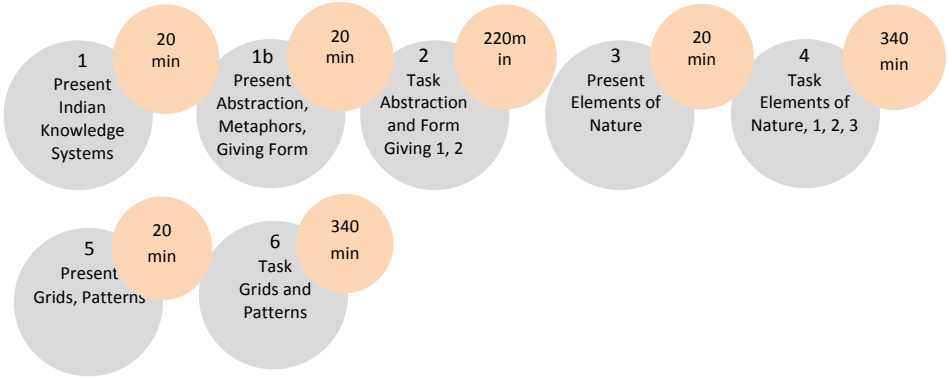
Grouping:

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

Exposures:

Exposure 1: Introduction to Indian Knowledge Systems
Exposure 2: Abstraction, Metaphors and Giving Form
Exposure 3: Mapping of Elements of Nature
Exposure 4: Grids and Composition, Grids and Patterns

Task Sequence:



Design Thinking & Innovation Process involvement:

This task involves the following phases of the DT&I Process:
Phase 1. Observe/Empathise/Research (Exploring Abstraction and Form Giving)
Phase 2. Understand/Analyse/Define (Understanding Elements of Nature)
Phase 3. Ideate/Alternate/Create (Grids and Patterns alternatives)
Phase 4. Build/Prototype/Detail (making a 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 people and events, do think of gender equality and reduced inequalities and concern for life on our planet.

Task 1.0

Task 1.0 = 1.1 + 1.2 + 1.3 + 1.4:
School Hours: 13, Home hours: 7

Task 1.0

Overall Task (Task 1.0 = 1.1 + 1.2 + 1.3 + 1.4)
Topic title:

Introduction to Indian Knowledge Systems

The real world around us can be represented and visualized in a realistic manner and the form or shape that it takes is what we call as 'Realism'. This is a direct representation of the world around us.
On the other hand, aspects of the world around us such as ideas, notions, thoughts, expressions can be represented and visualized in an abstract manner and the form or shape that it takes is what we call as 'Abstraction'. This does not directly depict any person, place or thing but does it indirectly expressing the qualities and attributes through an image of a concept or metaphor.

The Design Process begins with the realisation of an abstract idea and the next step is metaphorising the abstract. This involves giving meaning to the formless ideas using universally understood examples, by mapping concepts from the real world. Using a design grammar from the metaphors then concretizes the abstract and is used to give the abstract a basic Form.

Some examples of abstraction can be found in arts and architecture, such as temples and other places of worship, abstract paintings, sculptures, and so on. The level of abstraction could be from low to medium to high depending on the representation.
Understanding of 'Abstraction' might sound a bit uncertain, fuzzy and unclear. The students will have a much better idea of 'Abstraction' and its role in Indian Knowledge Systems after they take up the challenge as stated in the below mentioned tasks.

The left most building is a famous fisheries office in Hyderabad, India, and is directly realistically represented using the form of a fish. The middle one is the Beijing Airport by Zaha Hadid architects. The roof of the airport is folded in such a way as to resemble the wings of a bird. It holds the essence and communicates it visually, but doesn't literally depict a bird. The third image is that of a temple, which is a highly abstract representation of the cosmos on earth using multi-layered metaphors (for example, the mapping of the different parts of the body to the temple).

More details on Indian Knowledge Systems at: https://jribh.github.io/IKS

Task 1.1a

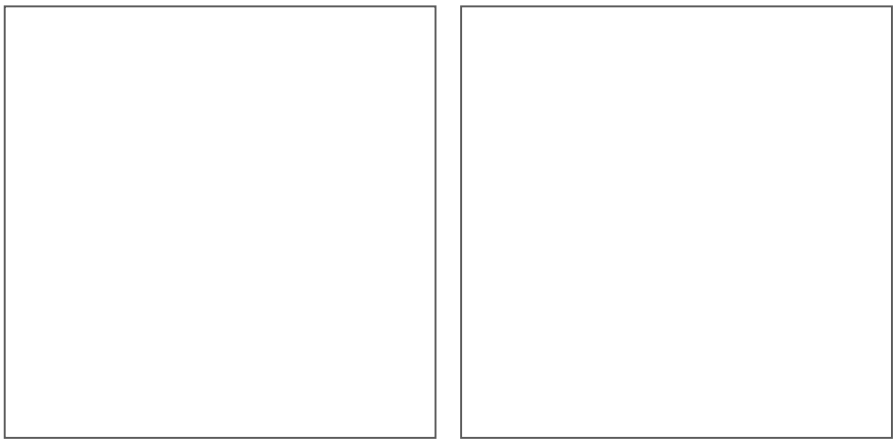
Task 1.1a:
School Hours: 2, Done individually at School

Topic title:

Abstraction and Form giving 1

Consider the following Formless ideas, and sketch them in simple abstract ways such that the core message gets communicated effectively.
A. Paradise and Earth
B. An Explosion
C. The Circle of Life
D. The Centre of the Universe
E. Inner Self

1. Think about what these key words mean to you
2. Visualise, give the idea a form/shape and sketch it
3. Make 2 versions of each idea on A4 size paper in boxes as shown below



Output 1.1a: Visualisation of the idea as sketches

Task 1.1b

Task 1.1b:
Home hours: 2, done individually at Home

Topic title:

Abstraction and Form giving 2:

This task is to understand metaphors to communicate stories as a way of Abstraction.

1. Write a simple story in five lines using the words given below in form of text: Sunrise, Perseverance, Colours, Fear, Determination, Elaborate

2. Using simple abstract shapes, communicate the story in the given five frames as images. Frame 1, 2, 3, 4, 5
3. Use pen/pencil. You can use some colour only if absolutely necessary

Output 1.1b: Story + Visualisation of the story as images

Task 1.2a

Task 1.2a:
Home hours: 2, done individually

Topic title:

Elements of Nature 1:

Introduction to mappings as a way to metaphorise the abstract using examples like elements of nature mappings.
1. Consider the five elements of nature; earth, water, fire, wind and space
2. Click a pictures of articles/things corresponding to each of the elements showing the mapping (representation) of these elements
- Can take articles in and around your house, paintings, patterns, objects and so on
3. For each of the images, write in one or two lines how you think the mapping has been done
Output 1.2a: 5 images + write-up to be presented in class

Task 1.2b

Task 1.2b:
School hours: 2, Done individually

Task Title:

Elements of Nature 2:

In this task the mappings as a way to metaphorise the abstract are understood through human body mappings.

1. Draw the above human body silhouette
2. Label it with the given words in such a way that the labeled body part best

compliments the word
Movement, Thought, Life, Motion, Work, Rest
3. In addition to the above, label which part of the body best represents the five elements of nature
Earth, Water, Fire, Wind and Space
Output 1.2b: Human body silhouette with the labels

Task 1.2c

Task 1.2c:
Home hours: 2, Done individually

Task Title:

Elements of Nature 3:

In this task the students understand how the design principles can be applied visually using different shapes and concepts like positions and hierarchies.
1. Take 5 different leaves/flowers/stones (any one of these) of different sizes, shapes, textures and colours
2. Arrange the leaves/flowers/stones in a hierarchical order based on their visual attributes like size, colour, shape, etc.
3. Explain what kind of hierarchical order is it based on
3. This is an example shown below of leaves arranged hierarchically.

Output 1.2b: Any one of these (leaves/flowers/stones) arranged hierarchically

Task 1.3a

Task 1.3a:
School hours: 2, Done individually

Topic title:

Grids and Compositions 1:

In this task the students will identify grids and compositions used in sacred architectural spaces.
1. Take any temple/mosque/church floor plan and trace it out or take the print out:
• Identify and draw the major and minor grids
• Identify major mappings if applicable and label them
• Label the cardinal directions
• Label the different parts of the plan (Eg: grabhagriha in temple, mihrab in a mosque, alter in church)
Output 1.3a: Identification of grids and other factors in sacred architectural spaces

Task 1.3b

Task 1.3b:
Home hours: 2, Done individually

Topic title:

Grids and Compositions 2:

In this task the students will identify principles of design, composition, storytelling and abstraction through visual analysis of ancient sculptures.

1. Take any Ellora Cave Figure, trace or print it out, and do the following:
• What is the story behind the figure?
• How have the elements of the story been abstracted and shown?
• Mark the major grids on the figure
• Mark points of focus on the figure
Output 1.3b: Identification of design principles in sculptures

Task 1.4a

Task 1.4a:
School hours: 3, Done individually

Topic title:

Grids and Patterns 3:

In this task the students will identify grids and patterns used for making Rangoli in different parts of our country.

1. Select images of 2 Rangoli patterns as practiced in other states (outside your own state)
2. Identify the basic grid used in making of the Rangoli Pattern
3. Identify the material used for the Rangoli
4. How are the materials used for the Rangoli sustainable?
5. On which occasion is the Rangoli made?
6. Based on your study, make a Rangoli at home and click a picture of it
Output 1.3: Study and analysis of 2 types of Rangoli patterns and making of one at home

Task 1.4b

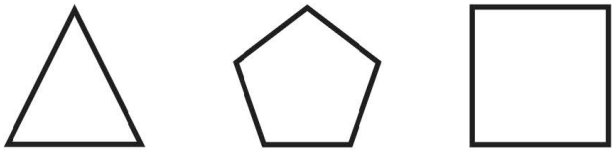
Task 1.4b:
School hours: 3, Done individually

Topic title:

Grids and Fractal Patterns

In this task the students will understand the use of repeated recurring patterns or self-similar replication of forms can be used to detail designs,.

1. Take any one of the shapes given below:

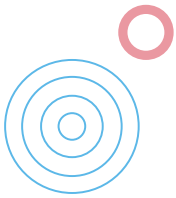


2. Join the midpoints of each edge to get a smaller version of the same shape. 3. Continue the process until you can't go any further
3. In the above task, the midpoints were joined. Try what happens if we try to join the points a third of the distance away from the vertex
Output 1.3b: Drawings of recurring patterns

Reflection:

Questions to ponder:
- Would you like to study some more about Indian Knowledge Systems?
- Do you now feel that abstraction, use of metaphors, storytelling, grids, patterns and fractals are useful?
- Would you like to use some of these principles at your home?
- Next time you go to a temple/mosque/church/gurudwara, will you look for these principles?

Self Assessment:



Assessment Criteria (Task 1.1 + 1.2 + 1.3) – Assess yourself:
- Abstraction and Form Giving tasks were done well by Visualisation of the Idea as sketches (Individual Task 1.1a)

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

- Abstraction and Form Giving tasks were done well by creating an appropriate story and then visualizing it as images (Individual Task 1.1b)

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

- The pictures of articles/things mapping (representation) to each of the elements of nature were done well. (Task 1.2a)

☐ *Beginning* ☐ ☐ *Promising* ☐ ☐ *Excellent*

- The mapping (representation) to human body the keywords and the elements of nature were done well. (Task 1.2b)

☐ *Beginning* ☐ ☐ *Promising* ☐ ☐ *Excellent*

- The mapping of design principles for organizing the chosen objects in terms of heirarchy were done well. (Task 1.2c)

☐ *Beginning* ☐ ☐ *Promising* ☐ ☐ *Excellent*

- The Identification of grids and other factors in sacred architectural spaces were done well (Task 1.3a)

☐ ☐ ☐ ☐ ☐

Beginning *Promising* *Excellent*

- The identification of design principles in sculptures was done well (Task 1.3b)

☐ ☐ ☐ ☐ ☐

Beginning *Promising* *Excellent*

- The Identification of grids and other factors in Rangoli pattern as well as making of one was done well (Task 1.4a)

☐ ☐ ☐ ☐ ☐

Beginning *Promising* *Excellent*

- The drawing of recurring patterns as fractals was done well (Task 1.4b)

☐ ☐ ☐ ☐ ☐

Beginning *Promising* *Excellent*

Other References:

Other suggested References:

1. **References:**

Introduction to Indian Knowledge Systems – detailed resources along with interactive resources:
https://jribh.github.io/IKS

2. Visual Symmetry:
https://www.dsource.in/course/visual-symmetry

3. Konarak Temple
https://www.dsource.in/resource/sun-temple-konark-orissa

2.0 **Module 2**

Design for Personal Space:

- through sensory experiences

20 hours (13 in school and 7 at home)

Design Thinking

Design Projects

Exposure 1 - Introduction to Sensories

Exposure 2 - Examples of design for Personal Spaces

2.1 **Task** (at School + Home) - Research and Analysis

2.2 **Task** (at School + Home) - Ideation, Prototyping and Feedback

Final Output - A presentation of the project

+ Reflections, Self Assessment and References

2.0 Module 2

Design Project:
Design for Personal Space
- through sensory experiences

20 hours (13 in school and 7 at home)

Introduction

This module looks at design for personal spaces. Personal spaces are spaces near and dear to you. This includes the design of artifacts that one wears and carries. These designs tend to be the following:
a. Personal
b. Sensory
c. Experiential
d. Expressional and
e. Individualistic and not necessarily shared.

Aim of the Course

To expose students (Grade 12) to fundamentals and principles of sensories and application of this to design of artifacts in the personal space. This task is an individual task where the students explore artifacts that are part of the personal space.
These could include jewelry, clothing and footwear, writing artifacts; carry bags, mobiles, etc.

Place:

Place: Task 2.1 and Task 2.2
– done at both school and at home

Grouping:

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

Equipment:

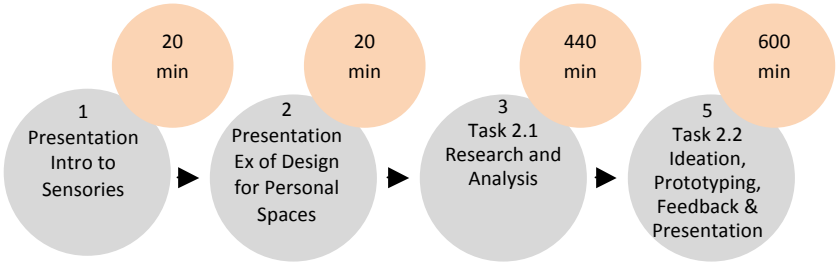
Smart Mobile phone with Camera + Sketchbooks for taking notes and creating storyboards/scenarios, Stationary (Pencils, Pens). Mobile can be used for editing. Students may use digital devices like computers or tablets for editing (if available, but not necessary)

Exposures

Exposure 1: Introduction to Sensories
Exposure 2: Examples of examples of Design for Personal Spaces

Task Sequence:

Task 2.1 + Task 2.2



Design Thinking & Innovation Process involvement:

This task involves the following phases of the DT&I Process:
Phase 1. Observe/Empathise/Research (observation of sensories)
Phase 2. Understand/Analyse/Define (Analysis of the personal space)
Phase 3. Ideate/Alternate/Create (trying creative alternatives)
Phase 4. Build/Prototype/Detail (making prototypes, 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 2.0

Task 2.0 = 2.1 + 2.2

School Hours: 13, Home hours: 7

Task 2.0:

Done at School + Home

Overall Task (Task 2.0 = 2.1 + 2.2)

Topic title:

Design Thinking Process Project: Designing for Personal Space - through sensory experiences

Theme:

Exploring Sensories:

Our senses define the way we perceive the world. In this project the students are encouraged to look at the principles of our sensories and apply them to design products or artifacts that are of importance to the personal spaces.

You may choose any one of these sensories to work with:
- Taste, Touch, Sight, Smell and Hearing

The final solutions could be redesigning any of these:

a. Wearables - watch, dress, shoes, clothes, jewelry, accessories, etc.

b. Personal Objects – pens, diary, bags, photos, etc

c. Personal Artifacts - toys, posters, t-shirts, pens, etc.

The task involves the following steps:

0. Selection of problem to solve

2.1a Observation and asking Questions (do brainstorming + mindmapping)

2.1b Primary research by conversing with users

2.1c Secondary research by finding out already existing information

2.1d Analysis (do categorisation and affinity mapping)

2.2a Ideation and alternate concepts (moodboard could help)

2.2b Soft Prototyping and feedback

2.2c Presentation and evaluation

Task 2.1:

Done at School + Home

Task 2.1 = 2.1a + 2.1b + 2.1c + 2.1d
School Hours: 6 and Home Hours: 3
Done individually at School and Home

Task Title:

Understanding the problem area/space and analysis:

Task 2.1a:

Done at School

Task 2.1a
School Hours: 2
Done individually at School

Topic title:

Observation and Ask Questions

School hours: 2, done individually

1. Chose one or two sensories to explore this task:
It could involve any one or two of the following:
a. Sense of Touch
b. Sense of Sight
c. Sense of Hearing
d. Sense of Smell
e. Sense of Taste
2. Make a list of personal artifacts or things that you would like to design with the chosen sensories
These are some examples that you could choose from:
a. Wearable watch for children with difficulty in seeing
b. Shoes for Climbing
c. Dress for the rains
c. Jewelry for Birthday celebrations
e. Soft Rattle for a 1 year Child
f. Plate for eating Dosa
g. Toy with different textures
h. Etc.
3. Ask the following questions about the above subject
What? Why? How? Whom? Where? When? etc.
4. Understand the subject well by first **Brainstorming** about it, noting down keywords and then making a **Mindmap** to look at the subject from different points of view and perspectives
Output 2.1a: Make a mindmap of the selected artifact – sub-topics, issues, problems, areas, users, +ves and –ves, etc.

Task 2.1b:

Done at School

Task 2.1b:

School hours: 2, Done individually at School

Task Title:

Primary Research:

The Primary research involves the following:

1. Identify users for your chosen area
2. Converse with the users involved with this activity to get a better understanding (take down notes), try to understand the activity from the user's point of view (empathize with the user)
3. Identify the objects that are involved and understand how it works (document these)
4. Document through photography or sketching the different aspects of the problem being solved

Output 2.1b: Make a summary presentation involving images and short text in form of a report or slides (around 6 to 10 pages or slides)

Task 2.1c:

Done at Home

Task 2.1c:

Home hours: 2, Done individually at Home

Task Title:

Secondary Research:

Secondary research as the name indicates is the 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. Analyze your topic into sub-topics and take-up one of these for further research and understanding
2. Search for information on media that is accessible to you. Take down notes as points. Mark important aspects

Output 2.1c: Collate the information involving images and short text in form of a report or slides (around 6 to 10 pages or slides)

Task 2.1d:

Done at School

Task 2.1d

School Hours: 2 and Home hours 1
Done individually

Task Title:

Analysing the problem to be solved:

1. Collate all the information as points (you could use sticky notes)
2. Classify the information into different categories according to affinities (some may fit in multiple categories so replicate them)
3. Priorities the information within the categories according to priority/ importance

4. Identify issues or problems that can be solved
Output 2.1d: Identification and listing of problems to be solved

Make a chart of classifying the information collected according to the following:

Observations	Inferences/Insights	Design Opportunities
1.		
2.		
3.		

Task 2.2

Task 2.2 = 2.2a + 2.2b + 2.2c
School Hours: 7 and Home Hours: 4
Done individually at School and Home

Task Title:

Ideation + Prototyping + Presentation:

Task 2.2a

Task 2.2a
Home hours: 3
Done individually at Home

Topic title:

Ideation on Creative Design Solution Possibilities + Shortlisting of Ideas

1. Brainstorm, Ideate on possible creative solutions and sketch these out + number or name these ideas
2. Collate all the good ideas together and short-list them according to their experiential potential and ease of implementation
Output 2.2a: Make a presentation of these in 3 slides (alternate sketches + short-listed idea)

Task 2.2b

Task 2.2b
School hours: 4
Done individually at School

Topic title:

Design Solution Mock-ups + Feedback

1. Select the best one out of your ideation and finalise it with details.
2. Detail out the final selected solution as sketches: the details could be about its form, colors, materials, technology, etc.
3. Make a mock-up of your final idea in actual size using clay or paper/ cardboard (optional)
4. Show the sketches /mock-up to potential users and get feedback
5. Incorporate suggestions from the feedback in your design
6. Make the final sketch of your design (with an optional paper prototype)
Output 2.2b: Make a presentation of these in 3 slides (mock-up + feedback + details)

Task 2.2c

Task 2.2c
School hours: 3 and Home hours: 1
Done individually at School and Home

Topic title:

Design Solution Final Presentation and Documentation

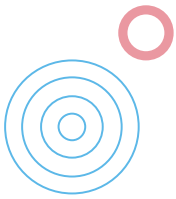
Prepare a presentation (of 6-8 minutes duration) to include all the stages of your project:
a. Title of the Personal Space Design Project or Problem Statement
b. Your Name
c. Summary/content listing of your presentation
d. Insights from Primary and Secondary Research
e. Analysis
f. Alternate Concepts (sketches + quick scenarios + concept models)
g. Final Concept sketch and its unique features
h. Prototype /Mock-up (optional)
k. User feedback on your final solution
l. Future steps and suggestions
m. Full References (Learn how to do references)
n. Acknowledgments – to all who have helped
Output 2.2c: A presentation (6-8 minutes – roughly 15 to 25 slides) explaining the Project outcome along with Process

Reflection:

Questions to ponder:

- Do you feel your sensories play a part in the design of artifacts in personal space?
- Would you like design your own artifacts – clothes, accessories, etc.?
- Would you like to pursue a profession designing for personal spaces?

Self Assessment:



Assessment Criteria (Task 2.1a + 2.1b + 2.1c + 2.1d + 2.2a + 2.2b + 2.2c) – Assess yourself:

- Observation, Asking Questions and making a mind-map for understanding Personal Space was done well. (Group + Individual Assessment, Task 2.1a)

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

- The Primary and secondary research for understanding Personal Space was done well. (Group + Individual Assessment, Task 2.1b + 2.1c)

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

- The analysis of the personal problem space was well conceived. (Group + Individual Assessment, Task 2.1d)

☐ *Beginning* ☐ ☐ *Promising* ☐ ☐ *Excellent*

- The ideation for this project on Personal Space had many alternate concepts. (Group + Individual Assessment, Task 2.2a)

☐ *Beginning* ☐ ☐ *Promising* ☐ ☐ *Excellent*

- The soft prototyping was done very well. (Group + Individual Assessment, Task 2.2b)

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

- The presentation of this project on Personal Space was done well. (Group + Individual Assessment, Task 2.2c)

☐ *Beginning* ☐ ☐ *Promising* ☐ ☐ *Excellent*

Other References:

O`ther suggested References:

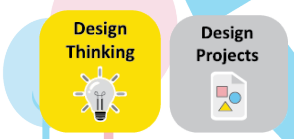
1. Design Thinking Process - explained with an example: https://www.youtube.com/watch?v=uRtAzzitBmA
2. Design Thinking Framework - a short video: https://www.youtube.com/watch?v=LhQWrHQwYTk

3.0 **Module 3**

Design for Social Space:

- through empathy building/affinities

20 hours (13 in school and 7 at home)



Exposure 1	- Introduction to Social Spaces
Exposure 2	- Examples of design for Social Spaces
Task 3.1 (at School + Home)	- Research and Analysis
Task 3.2 (at School + Home)	- Ideation, Prototyping and Feedback
Final Output	- A presentation of the project + Reflections, Self Assessment and References

3.0 Module 3

Design Project:
Design for Social Spaces
- through empathy building

20 hours (13 in school and 7 at home) = 20 credits

Introduction

This module looks at design for social spaces. Social spaces are inter-personal largely driven by affinities and empathy. This includes the design of artifacts that are shared as well as concerns about social issues. These designs tend to be the following:

a. Inter-personal
b. Social
c. Empathy driven
d. Collaborative
e. Partnerships and shared

Aim of the Course

To expose students (Grade 12) to fundamentals and principles of social design and application of this to design of artifacts and social issues. This task is an individual task where the students explore artifacts and issues that are part of the social design space.
These could include sharing books, toys and games, sharing of resources, creating common facilities, addressing social problems, connecting people, etc.

Place:

Place: Task 3.1 and Task 3.2 done at School and at home

Grouping:

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

Equipment:

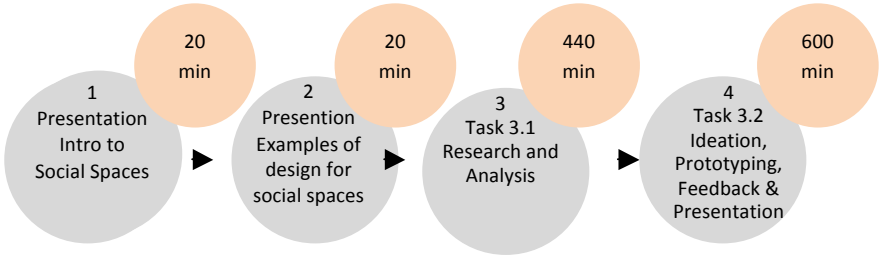
Equipment: Sketchbooks for sketching, Stationary (Pencils, Pens, Colours, Tracing paper), students are advised to use digital devices like computers or tablets (if available, but not necessary)

Exposures

Exposure 1: Introduction to Social Spaces
Exposure 2: Examples of design for Social Spaces

Task Sequence

Task 3.1 + Task 3.2



Design Thinking & Innovation Process involvement:

This task involves the following phases of the DT&I Process:
Phase 1. Observe/Empathise/Research (observation of social spaces and issues)
Phase 2. Understand/Analyse/Define (Analysis of the social space)
Phase 3. Ideate/Alternate/Create (trying creative alternatives)
Phase 4. Build/Prototype/Detail (making prototypes, 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 3:

Task 3 = 3.1 + 3.2
School Hours: 8, Home hours: 4

Task 3.0:

Done at School + Home

Overall Task (Task 3.0 = 3.1 + 3.2)

Topic title:

Design Thinking Process Project: Designing for Social Space - through Empathy Affinities/Building

Theme:

Exploring Shared spaces:

We are social. We share, collaborate, play with each other, work together, form partnerships and collaborate to form teams. We share products, artifacts and services that are of importance to the social spaces. In addition to this, there are many social issues that need to be solved. Building empathy and concern for the problems of others is the key to designing for social spaces.

You may choose any one of these social attributes to work with:
- Inter-personal, collaborative, co-operative, sharing and giving

The final solutions could be solving problems on any of these issues:

a. Social Issues- gender, in-equality, displacement, poverty, etc.

b. Inter-personal artifacts – cutlery, books, toys, stationary, etc.

c. Social events - festivals, celebrations, sports, games, etc.

d. Social Facilities – shared spaces, drinking water, notice boards, etc.

The task involves the following steps:

Selection of problem to solve

3.1a Observation and asking Questions (do brainstorming + mindmapping)

3.1b Primary research by conversing with users

3.1c Secondary research by finding out already existing information

3.1d Analysis (do categorisation and network social mapping)

3.2a Ideation and alternate concepts

3.2b Soft Prototyping and feedback

3.2c Presentation and evaluation

Task 3.1:

Done at School + Home

Task 3.1 = 3.1a + 3.1b + 3.1c + 3.1d

School Hours: 6 and Home Hours: 3

Done individually at School and Home

Task Title:

Understanding the problem area/space and analysis:

Task 3.1a:

Done at School

Task 3.1a

School Hours: 2

Done individually at School

Topic title:

Observation and Ask Questions

School hours: 2, done individually

1. Designing for a social space or a social issue for this task could involve any of the following factors:

a. Sharing
b. Collaboration
c. Giving
d. Doing together
e. Forming partnerships
f. Addressing social issues

2. Make a list of social spaces or social issues that you would like to design that could involve any of the above mentioned factors

These are some examples that you could choose from:

a. Social awareness poster campaign on gender issues, inequality, poverty, etc.
b. Story Book addressing social issues
c. Music video highlighting community harmony
d. Board or Card game on sharing of resources
e. Design of shared spaces for drinking water
f. Graphic poster on friendship across borders
g. Design of Products useful for inter-personal use
h. Etc.

3. Ask the following questions about the above subject

What? Why? How? Whom? Where? When? etc.

4. Understand the subject well by first **Brainstorming** about it, noting down keywords and then making a **Mindmap** to look at the subject from different points of view and perspectives

Output 2.1a: Make a mindmap of the selected artifact – sub-topics, issues, problems, areas, users, +ves and –ves, etc.

Task 3.1b:

Done at School

Task 3.1b:

School hours: 2, Done individually at School

Task Title:

Primary Research:

The Primary research involves the following:

1. Identify the primary users
2. Converse with the people involved with this activity to get a better understanding (take down notes), try to understand the activity from the user's point of view (empathise with the user)
3. Identify the objects that are involved and understand how it works (document these)
4. Document through photography or sketching the different aspects of the problem being solved

Output 2.1b: Make a summary presentation involving images and short text in form of a report or slides (around 6 to 10 pages or slides)

Task 3.1c:

Done at Home

Task 3.1c:

Home hours: 2, Done individually at Home

Task Title:

Secondary Research:

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. Analyze your topic into sub-topics and take-up one of these for further research and understanding
2. Search for information on media that is accessible to you. Take down notes as points. Mark important aspects

Output 2.1c: Collate the information involving images and short text in form of a report or slides (around 6 to 10 pages or slides)

Task 3.1d:

Done at School

Task 3.1d

School Hours: 2 and Home hours 1
Done individually

Task Title:

Analysing the problem to be solved:

1. Collate all the information as points (you could use sticky notes)
2. Classify the information into different categories according to **affinities** (some may fit in multiple categories so replicate them)
3. **Prioritize** the information within the categories according to priority/ importance

4. Make **Network Social Map** of the interconnections between the social spaces and issues and their interactions
4. Identify issues or problems that can be solved
Output 3.1d: Identification and listing of problems to be solved

Task 3.2

Task 3.2 = 3.2a + 3.2b + 3.2c

School Hours: 7 and Home Hours: 4

Done individually at School and Home

Task Title:

Ideation + Prototyping + Presentation:

Task 3.2a

Task 3.2a

Home hours: 3

Done individually at Home

Topic title:

Ideation on Creative Design Solution Possibilities + Shortlisting of Ideas

1. Brainstorm, Ideate on possible creative solutions and sketch these out + number or name these ideas
2. Collate all the good ideas together and short-list them according to their experiential potentials and ease of implementation

Output 2.2a: Make a presentation of these in 3 slides (alternate sketches + short-listed idea)

Task 3.2b

Task 3.2b

School hours: 4

Done individually at School

Topic title:

Creating Scenarios, Design mock-ups and detailing

1. Select the best of your solutions/suggestions
2. Create a scenario to demonstrate in 5 steps how to use your selected idea. You can use characters to build the scenario
3. You could also try making a mock-up of your final idea using card-board/easily available materials
4. Detail out the final selected solution: the details could be about its shape/form, materials, listing of advantages/disadvantages and how to implement/maintain

Output 4c: make a presentation of these in 3 slides (scenario + mock-up + details)

Task 3.2c

Task 3.2c
School hours: 3 and Home hours: 1
Done individually at School and Home

Topic title:

Design Solution Final Presentation and Documentation

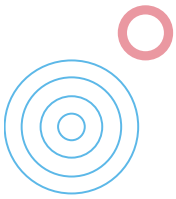
Prepare a presentation (of 6-8 minutes duration) to include all the stages of your project:
a. Title of the Social Space Design Project or Problem Statement
b. Your Name
c. Summary/content listing of your presentation
d. Insights from Primary and Secondary Research
e. Analysis
f. Alternate Concepts (sketches + quick scenarios + concept models)
g. Final Concept sketch and its unique features
h. Prototype /Mock-up (optional)
k. User feedback on your final solution
l. Future steps and suggestions
m. Full References (Learn how to do references)
n. Acknowledgments – to all who have helped
Output 3.2c: A presentation (6-8 minutes – roughly 15 to 25 slides) explaining the Project outcome along with Process

Reflection:

Questions to ponder:

- Do you feel your empathy plays a part in the design of artifacts in social spaces?
- Would you like designing for social concerns?
- Would you like to pursue Social Design as a profession?

Self Assessment:



Assessment Criteria (Task 3.1a + 3.1b + 3.1c + 3.1d + 3.2a + 3.2b + 3.2c) – Assess yourself:

- Observation, Asking Questions and making a mind-map for understanding Social Space was done well. (Group + Individual Assessment, Task 3.1a)

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

- The Primary and secondary research for understanding Social Space was done well. (Group + Individual Assessment, Task 3.1b + 3.1c)

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

- The analysis of the social problem space was well conceived. (Group + Individual Assessment, Task 3.1d)

☐ *Beginning* ☐ ☐ *Promising* ☐ ☐ *Excellent*

- The ideation for this project on Social Space had many alternate concepts. (Group + Individual Assessment, Task 3.2a)

☐ *Beginning* ☐ ☐ *Promising* ☐ ☐ *Excellent*

- The soft prototyping was done very well. (Group + Individual Assessment, Task 3.2b)

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

- The presentation of this project on Social Space was done well. (Group + Individual Assessment, Task 3.2c)

☐ *Beginning* ☐ ☐ *Promising* ☐ ☐ *Excellent*

Other References:

O`ther suggested References:

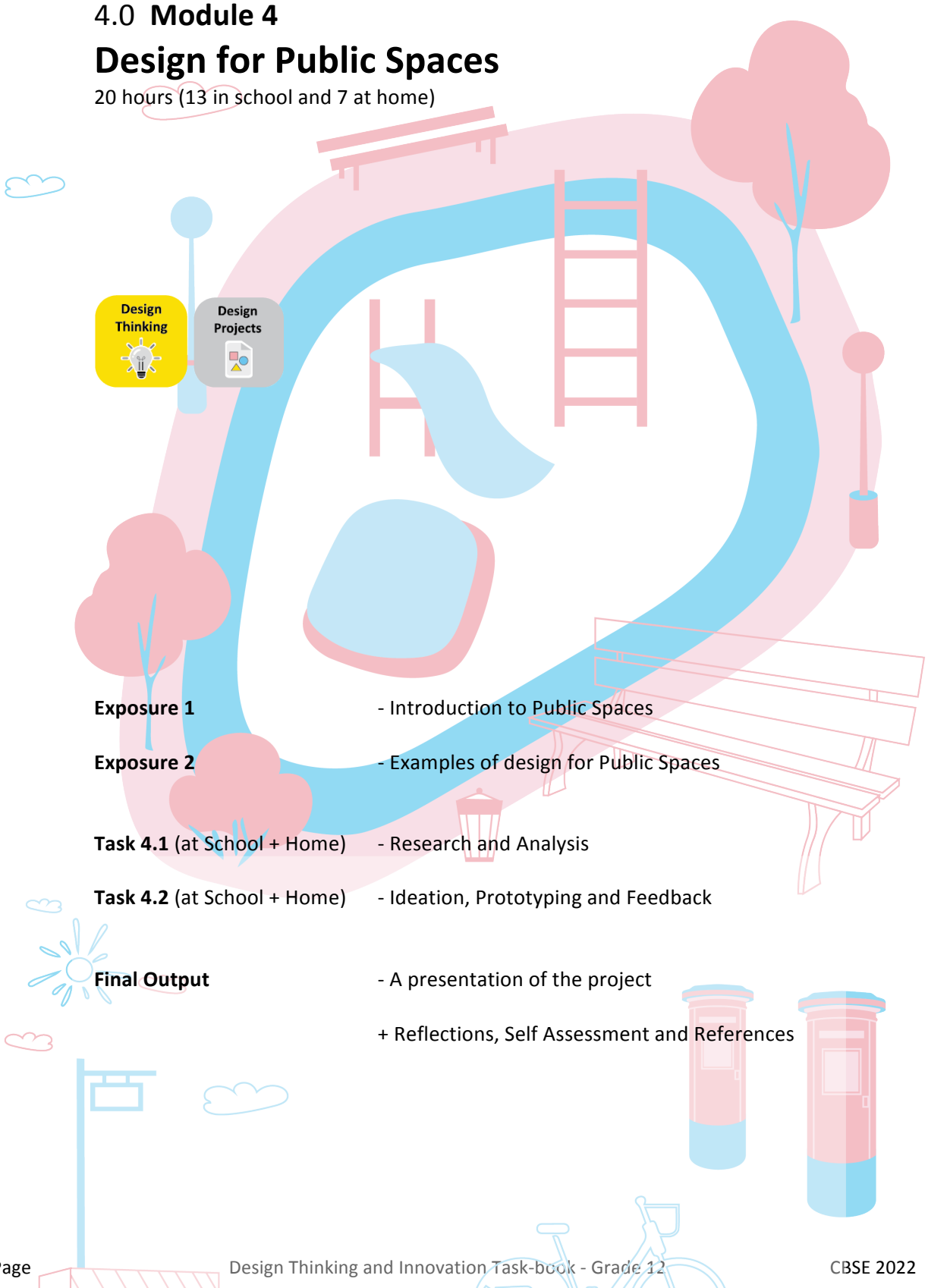
1. Design Thinking Process - explained with an example: https://www.youtube.com/watch?v=uRtAzzitBmA

2. Design Thinking Framework - a short video: https://www.youtube.com/watch?v=LhQWrHQwYTk

4.0 **Module 4**

Design for Public Spaces

20 hours (13 in school and 7 at home)



Exposure 1 - Introduction to Public Spaces

Exposure 2 - Examples of design for Public Spaces

Task 4.1 (at School + Home) - Research and Analysis

Task 4.2 (at School + Home) - Ideation, Prototyping and Feedback

Final Output - A presentation of the project

+ Reflections, Self Assessment and References

4.0 **Module 4**

Design Project:
Design for Public Spaces

(20 hours at school + 7 hours at home)

Introduction

This module looks at design for public spaces. Public spaces are common facilities used by many. This includes the design of artifacts and services that are shared. These designs tend to be the following:

a. Common
b. Public
c. Duty driven
d. Community
e. Citizenship
f. Trusteeship

Aim of the Course

To expose students (Grade 12) to fundamentals and principles of public design and application of this to design of artifacts and services. This task is a group task where the students explore artifacts and services that are part of the public design space.

These could include drinking water, playgrounds, parks, gardens, museums, airports, bus/railway stations, bus stops, public toilets, libraries, etc.

Place:

Place: Task 4.1, 4.2, 4.3, 4.4, and 4.5 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)

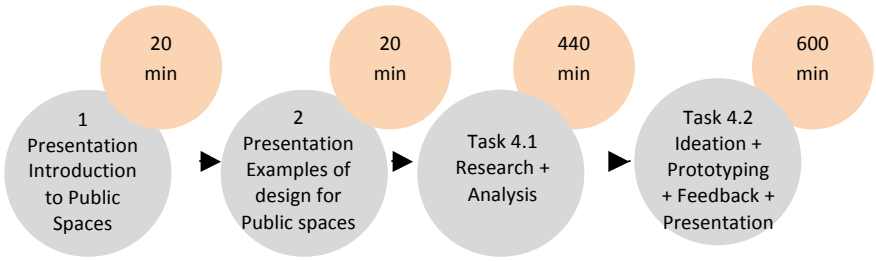
Exposures

Exposure 1: Introduction to Public Spaces

Exposure 2: Examples of design for Public Spaces

Task Sequence

Task 4.1 + Task 4.2



Design Thinking & Innovation Process involvement:

This task involves the following phases of the DT&I Process:
Phase 1. Observe/Empathise/Research (observation of Public spaces and services)
Phase 2. Understand/Analyse/Define (Analysis of the public space)
Phase 3. Ideate/Alternate/Create (trying creative alternatives)
Phase 4. Build/Prototype/Detail (making prototypes, 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 4:

Task 4 = 4.1 + 4.2
School Hours: 13, Home hours: 7

Task 4.0:

Done at School + Home

Overall Task (Task 4.0 = 4.1 + 4.2)

Topic title:

Design Thinking Process Project: Designing for Public Space - for community needs

Theme:

Exploring Common Community spaces and services:

We are social. We share, collaborate, play with each other, work together, form partnerships and collaborate to form teams. We share products, artifacts and services that are of importance to the social spaces. In addition to this, there are many social issues that need to be solved. Building empathy and concern for the problems of others is the key to designing for social spaces.

You may choose any one of these attributes to work with:
- collective, common, shared, public, group

The final solutions could be solving problems connected with any of these issues:

a. Drinking water,
b. Playgrounds, parks, gardens, museums,
c. Airports, bus/railway stations, bus stops,
d. Public toilets,
e. Libraries,
f. Etc.

The task involves the following steps:

0. Selection of problem to solve
2.1a Observation and asking Questions (do brainstorming + mindmapping)
2.1b Primary research by conversing with users
2.1c Secondary research by finding out already existing information
2.1d Analysis (do catogorisation and activity mapping)
2.2a Ideation and alternate concepts
2.2b Soft Prototyping and feedback
2.2c Presentation and evaluation

Task 4.1:

Done at School + Home

Task 4.1 = 4.1a + 4.1b + 4.1c + 4.1d

School Hours: 6 and Home Hours: 3

Done in groups of 3-4 at School and individually at Home

Task Title:

Understanding the problem area/space and analysis:

Task 4.1a:

Done at School

Task 4.1a

School Hours: 2

Done in groups of 3-4 at School

Topic title:

Observation and Ask Questions

School hours: 2, done individually

1. Designing for a public space artifact or service could involve any of the following factors:

a. Sharing

b. Collective

c. Common

d. Free and Open

2. Make a list of public spaces or services that you would like to design that could involve any of the above mentioned factors

These are some examples that you could choose from:

a. Design of a Cycle Stand in your school or a Bus Stop

b. Design of common facilities for newspaper reading

c. Design of Signage for the Playground

d. Design of posters on health and wellbeing

e. Payment of fees at the school office

e. Etc.

3. Ask the following questions about the above subject

What? Why? How? Whom? Where? When? etc.

1. Understand the subject well by first **Brainstorming** about it, noting down keywords and then making a **Mindmap** to look at the subject from different points of view and perspectives

Output 2.1a: Make a mindmap of the selected artifact – sub-topics, issues, problems, areas, users, +ves and –ves, etc.

Task 4.1b:

Done at School

Task 4.1b:

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

Task Title:

Primary Research:

The Primary research involves the following:

1. Identify the primary users
2. Converse with the people involved with this activity to get a better understanding (take down notes), try to understand the activity from the user's point of view (empathize with the user)
3. Identify the objects that are involved and understand how it works (document these)
4. Document through photography or sketching the different aspects of the problem being solved

Output 2.1b: Make a summary presentation involving images and short text in form of a report or slides (around 6 to 10 pages or slides)

Task 4.1c:

Done at Home

Task 4.1c:

Home hours: 2, Done individually at Home

Task Title:

Secondary Research:

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. Analyze your topic into sub-topics and take-up one of these for further research and understanding
2. Search for information on a media that is accessible to you. Take down notes as points. Mark important aspects

Output 2.1c: Collate the information involving images and short text in form of a report or slides (around 3 to 4 pages or 6-8 slides)

Task 4.1d:

Done at School

Task 4.1d

School Hours: 2 and Home hours 1

Done in groups of 3-4 at School and Done individually at Home

Task Title:

Analysing the problem to be solved:

1. Collate all the information as points (you could use sticky notes)
2. Classify the information into different categories according to **affinities** (some

may fit in multiple categories so replicate them)
3. **Prioritize** the information within the categories according to priority/ importance
4. Make an **Activity Map** of the interactions between the public spaces, artifacts and services and people
4. Identify issues or problems that can be solved
Output 3.1d: Analysis of the Public Problem Space along with the activity map to be made into slides

Task 4.2

Task 4.2 = 4.2a + 4.2b + 4.2c

School Hours: 7 and Home Hours: 4

Done individually at School and Home

Task Title:

Ideation + Prototyping + Presentation:

Task 4.2a

Task 4.2a

Home hours: 3

Done individually at Home

Topic title:

Ideation on Creative Design Solution Possibilities + Shortlisting of Ideas

1. Brainstorm, Ideate on possible creative solutions and sketch these out + number or name these ideas
2. Collate all the good ideas together and short-list them according to their experiential potential and ease of implementation
Output 4.2a: Make a presentation of the alternate ideas and the shortlisted one in 3 slides (alternate sketches + short-listed idea)

Task 4.2b

Task 4.2b

School hours: 4

Done individually at School

Topic title:

Design Solution Mock-ups + Feedback

1. Select the best one out of your ideation and finalise it with details.
2. Detail out the final selected solution as sketches: the details could be about its form, colors, materials, technology, etc.
3. Make a mock-up of your final idea in actual size using clay or paper/ cardboard (optional)
4. Show the sketches /mock-up to potential users and get feedback
5. Incorporate suggestions from the feedback in your design
6. Make the final sketch of your design (with an optional paper prototype)
Output 4.2b: Make a presentation of these in 3 slides (mock-up + feedback + details)

Task 4.2c

Task 4.2c
School hours: 3 and Home hours: 1
Done individually at School and Home

Topic title:

Design Solution Final Presentation and Documentation

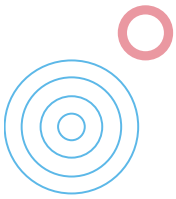
Prepare a presentation (of 6-8 minutes duration) to include all the stages of your project:
a. Title of the Public Space Design Project or Problem Statement
b. Your Name
c. Summary/content listing of your presentation
d. Insights from Primary and Secondary Research
e. Analysis
f. Alternate Concepts (sketches + quick scenarios + concept models)
g. Final Concept sketch and its unique features
h. Prototype /Mock-up (optional)
k. User feedback on your final solution
l. Future steps and suggestions
m. Full References (Learn how to do references)
n. Acknowledgments – to all who have helped
Output 4.2c: A presentation (6-8 minutes – roughly 15 to 25 slides) explaining the Project outcome along with Process

Reflection:

Questions to ponder:

- Do you feel your duty plays a part in the design of artifacts and services in public spaces?
- Would you like design for social concerns?
- Would you like to pursue Social Design as a profession?

Self Assessment:



Assessment Criteria (Task 4.1a + 4.1b + 4.1c + 4.1d + 4.2a + 4.2b + 4.2c) – Assess yourself:

- The Identification of Problem for the Public Space + the Mindmap was done well. (Individual Assessment, Task 4.1a)

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

- The Primary and secondary research was done well. (Group + Individual Assessment, Task 4.1b + 4.1c)

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

- The analysis of the public problem space was well conceived. (Group + Individual Assessment, Task 4.1d)

☐ *Beginning* ☐ *Promising* ☐ *Excellent*

- The ideation for this project had many alternate concepts. (Group + Individual Assessment, Task 4.2a)

☐ *Beginning* ☐ *Promising* ☐ *Excellent*

- The soft (low-fidelity) prototyping was done very well. (Group + Individual Assessment, Task 4.2b)

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

- The presentation of this project explaining the design process as well as the final solution was done well. (Group + Individual Assessment, Task 4.2c)

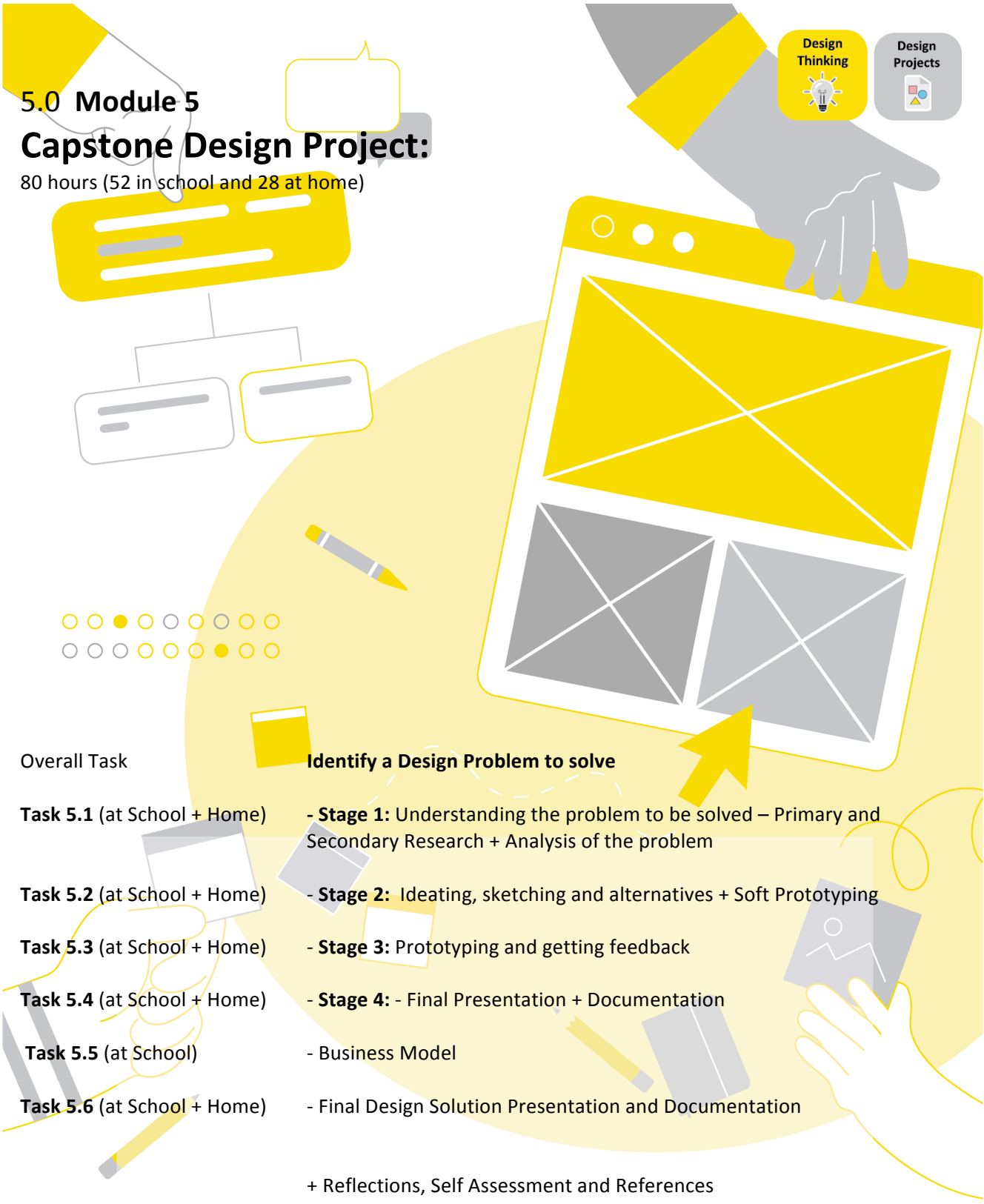
☐ *Beginning* ☐ *Promising* ☐ *Excellent*

Other References:

O`ther suggested References:

1. Design Thinking Process - explained with an example:
https://www.youtube.com/watch?v=uRtAzzitBmA

2. Design Thinking Framework - a short video:
https://www.youtube.com/watch?v=LhQWrHQwYTk



5.0 Module 5

Capstone Design Project:

80 hours (52 in school and 28 at home)

Overall Task	**Identify a Design Problem to solve**
Task 5.1 (at School + Home)	**- Stage 1:** Understanding the problem to be solved – Primary and Secondary Research + Analysis of the problem
Task 5.2 (at School + Home)	- **Stage 2:** Ideating, sketching and alternatives + Soft Prototyping
Task 5.3 (at School + Home)	- **Stage 3:** Prototyping and getting feedback
Task 5.4 (at School + Home)	- **Stage 4:** - Final Presentation + Documentation
Task 5.5 (at School)	- Business Model
Task 5.6 (at School + Home)	- Final Design Solution Presentation and Documentation
	+ Reflections, Self Assessment and References

5.0 **Module 5**

Capstone Design Project: Stage 1 + 2 + 3 + 4

(52 hours at school + 28 hours at home)

Introduction

This is the final design project the student does. The student needs to choose the topic for project with care. It is always helpful to make a list of possible topics that you would like to find solutions and then make a choice from this.
The students are discouraged from making choices first based on the media or technology and then trying to fit into this a problem to solve rather than identifying a problem area/issue /concern and then choosing the appropriate media and technology.
The capstone project can be done individually or jointly by a group of 2 students. When the students work as a group, each one should define their area of contribution to the design project.

Aim of this Module

This design project will make use of all the learning from previous modules as well as the use of the different stages of the design thinking process while solving a design problem of their choice. The project duration is 4 months and hence the problem-solving process can be done with a lot of depth and detail.

What will you learn?:
- Design thinking process and methodology for identifying a problem and finding appropriate solutions
- Ability to think critically, understand and analyze relevant information and collate data from both primary and secondary sources
- Confidence in being creative and to come up with alternative innovative ideas
- Prototype the final concept, get feedback and conceive of a business enterprise
- Use best practices of documentation and presentation – visual, written and oral

Stages of the Capstone Project

The capstone project will have the following stages:
5.1 - Stage 1: Understanding the problem to be solved – Primary and Secondary Research + Analysis of the problem
5.2 - Stage 2: Ideating, sketching and alternatives + Soft Prototyping
5.3 - Stage 3: Prototyping and getting feedback
5.4 - Stage 4: Final Presentation + Documentation Report

Output of the Project

The project will have the following outputs:
1. A presentation (15-20 minutes) explaining the different stages of the Design Process for this Project
2. A project report documentation of the project
3. A concept prototype and a working Demo of the project

Place:

Place: Task 5.1, 5.2, 5.3 and 5.4 done at School and at home

Grouping:

Grouping: The capstone design project can be done individually or in a group of 2 students

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)

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 5:

Task 5 = 5.1 + 5.2 + 5.3 + 5.4
School Hours: 52, Home hours: 28

Task 5:

Overall Task (Task 5.1 + Task 5.2 + Task 5.3 + Task 5.4):

Task Topic:

Final Capstone Design Project:

Theme:

Identify a problem to solve:

The student needs to identify a problem to solve. This needs to be done with a lot of care as this design project will have duration of 4 months and it is not prudent to change the project halfway.

Along with the identification of the problem to be solved, the following requirements could considered:
a. User Group
b. Subject area
c. Environment or space

The students could look at the different fields and issues covered in the previous grades/modules and make a list of these. Categorize them according to priorities and select a problem to solve. And, depending on the choice of the problem area the project could involve any of these design fields:
a. Communication Design
b. Product Design
c. Animation Design
d. Film Design
e. Digital Design

The Problem to solve:
- the choice of the problem should be decided by the student in discussion with the teacher.
- Since this project has a duration of 4 months, the selected problem can be solved with both depth and breadth
- The design process will include the following: research, understand needs, analyse requirements, ideate alternate solutions, finalise and build prototypes, get feedback, formulate a business plan and make a presentation, where the student/s should be able to justify the solution. The different stages of the design process as well as the final solution need to be documented as a report.

The students can work individually or in groups of 2. If the students are working in groups, then they need to work collaboratively and co-operatively together. They share the workload and are partner team members in solving the different stages of the problem.
They'll need to define their exact roles in solving the problem.

Task 5.1

Task 5.1 = 5.1a + 5.1b + 5.1c + 5.1d + 5.1e + 5.1f
School Hours: 13, and Home hours: 7
- done individually or done collaboratively in groups of 2

5.1 - Stage 1:

Understanding the problem to be solved
- Primary and Secondary Research
+ Analysis of the problem

Task 5.1a

Task 5.1a: Make Selections and Ask Questions
Home Hours: 1, done either individually or in groups of 2

Topic title:

Asking Questions:

1. Select the problem area of your chosen topic
2. Ask the following questions about the above the object
- What? Why? How? Whom? Where? When? etc.
3. Understand the subject well by first **Brainstorming** about it, noting down keywords and then making a **Mindmap** to look at the subject from different points of view and perspectives

Output 5.1a: Summarize this section with a short report and slides (around 3 to 5 pages or slides)

Task 5.1b

Task 5.1b: Secondary Research
School Hours 2, Home Hours: 2, done either individually or in groups of 2

Topic title:

Understanding the Problem Area through Secondary Sources:

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 media that is accessible to you. Take down notes as points. Mark important aspects

Output 5.1b: Collate the information involving images and short text in form of a report or slides (around 4 to 6 pages or slides)

Task 5.1c

Task 5.1c: Primary Research
School Hours: 4, done either individually or in groups of 2

Topic title:

Understanding the Problem Area through Primary Sources:

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 5.1d

Task 5.1d: Make (a) Journey/Activity Mapping + Spatial-social Mapping
School Hours 2, Home hours: 2, done either individually or in groups of 2

Topic title:

Analysis of the problem area through Visual Mappings:

Journey/Activity Mapping:
These are visualization of the different activities that happen in your chosen problem area on a time line.
1. Note down all the activities in a given period of time (the time to complete the activity/lifespan)
2. Note down on a timeline the sequence of the activities (you could drawings to represent some of them)
3. Note down the time taken to do the different activities
Output: Time Map of the activities represented on an A3 size sheet

Spatial-social Mappings:
1. Note down all the objects, facilities, and movement that happen in your chosen problem space
2. Plot the activities as a layout on an A3 size sheet
3. Sketch on it the objects that are in this space
4. Show the social interactions that happen in this space.
4. Mark the position of entry and exit points, and the path of movement of the users
Output: Space Map of the objects, facilities, and movement that happen in your chosen problem space represented on an A3 size sheet

Task 5.1e

Task 5.1e: Make Affinity Mapping + Find Connections
School Hours: 4, done either individually or in groups of 2

Topic title:

Analysis of the Problem Area through Classification and Affinities:

Information Sorting/Classification (Affinity Mapping):
1. Summarize information from primary + secondary research as points and write this on separate sticky notes (or on sheets of paper cut to size 5cm x 5cm). These are part of your **observations**
2. Classify the sticky or paper 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
Output: Classification of data collected and sorted according to its importance

Find Relational Link Connections:
4. Find connections (links) between the different groups of sticky notes.
5. These could be your **inferences and insights** from your study
6. 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 5.1e: Make a chart of classifying the information collected according to the following:

Observations	Inferences/Insights	Design Opportunities
1.		
2.		

- Based on these findings restate your problem with redefined objectives / goals

Task 5.1f

Task 5.1f: Presentation and Documentation of Stage 1
School Hours: 1, Home hours: 2, done either individually or in groups of 2

Topic title:

Stage 1 Presentation and Documentation:

Output 5.1f: Prepare a presentation (of 6-8 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. Analysis through Visual Mappings
f. Analysis through Categorisation and affinities
e. Listing of major design opportunities
f. Restatement of the problem / Design Objectives / Design Goals
g. Reference
h. Credits

Task 5.2

Task 5.2 = 5.2a + 5.2b + 5.2c
School Hours: 13, and Home hours: 7
- done individually or done collaboratively in groups of 2

5.2 - Stage 2:

Ideating, sketching and alternatives + Soft Prototyping

Task 5.2

Task 5.2a: Ideation and Alternate solutions
School hours: 4 and Home hours: 2, done either individually or in groups of 2

Topic title:

Ideation on Creative Innovative Design Solution Possibilities

- Ideate on possible solutions by sketching these
1. Your group could **brainstorm**, Ideate on possible creative innovative ideas and sketch these out + number or name these ideas
2. Make use of creativity techniques like **SCAMPER** to think of alternatives: Substitute, Combine, Adapt, Modify (magnify /minify), Put to another use , Eliminate, and Reverse
3. **Make visible your ideas** - through sketches, doodles, key-words, diagrams, scenarios, etc.
4. Quick sketches with fuzzy borders help in ideating further

Output 5.2a: Make a presentation of these ideas in 3 slides (alternate sketches of ideas)

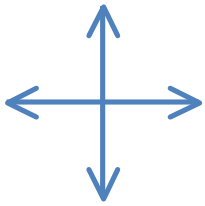
Task 5.2b

Task 5.2b: Selection of Ideas
School hours: 3 and Home hours: 1, done either individually or in groups of 2

Topic title:

Shortlisting of Ideas

1. Collate all the good ideas together
2. Evaluate these ideas by cross-checking with the redefined objectives or goals
An example:



Factors- 1-5 scale	Ease of Use	Aesthetic form	Innovative	Easy to Implement	Total
Concept 1	5	4	3	3	15
Concept 2	3	5	5	5	**18**
Concept 3	2	2	4	5	13

3. Short-list them according to their effectiveness, ease of use, ease of implementation, form, etc.

Output 8.3: Make a presentation of these in 3 slides (alternate sketches + Matrix + short-listed idea)

Task 5.2c

Task 5.2c: Convert Ideas to Concepts
School hours: 4 and Home hours: 2, done either individually or in groups of 2

Topic title:

Ideas to Concepts

1. Consider the top few ideas and convert them into concepts by refining them, detailing them, evaluating them, etc.
2. Make a quick paper or clay mock-up models to visualize the concept
3. The use of the concept can be made into a scenario through sketches
2. Get feedback on your concepts from users

Output 5.2c: Make a presentation of these in 3 slides (selected concepts + feedback)

Task 5.2d

Task 5.2d: Presentation and Documentation of Stage 2
School Hours: 2, Home hours: 2, done either individually or in groups of 2

Topic title:

Stage 2 Presentation and Documentation:

Output 5.2d: Prepare a presentation (of 6-8 minutes duration) to include all the stages of your project:
a. Title of the Design Project or Problem Statement
b. Team members
c. Summary/content listing of your presentation
d. Restatement of the problem / Design Objectives / Design Goals
e. Overview of your ideas
f. Alternate Concepts with sketches
g. Shortlisting of Ideas
h. Ideas to Concepts ((sketches + quick scenarios + concept models)
i. User Feedback
j. Select the final concept
k. Reference
l. Credits

Task 5.3

Task 5.3 = 5.3a + 5.3b + 5.3c
School Hours: 13, and Home hours: 7
- done individually or done collaboratively in groups of 2

5.3 - Stage 3:

Prototyping, Feedback and Iteration

Task 5.3a

Task 5.3a: Prototypes
School Hours: 2, Home hours: 2, done either individually or in groups of 2

Topic title:

Design Concepts Mock-ups Prototyping

1. Select the best one out of your final concepts and finalise it with details.
2. The final concept prototype could involve any of the following:
- 2D/3D design Sketches
- Mock-ups using paper, scenarios or video
- Physical Prototyping + Visualisation with 2D/3D Models
- Proof of Concept prototypes
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.

Prototype through 'Sketches':
1. Do sketches of your final concept from different points of view /angles and details to explain your idea
2. This can be done using many sheets or on a single A3 size sheet

Prototype through 'Paper Prototype' or 'Clay Prototype':
1. Do sketches on different cards in sequence to explain your idea
2. This can be done using many sheets and shown one after another
3. If it a 3D artifact, scaled model of the final concept can be done using clay

Prototype through 'Scenario Building':
1. Create a sequence of events of actions and reactions by the typical users almost creating a story board on how to use your idea
2. You can write and describe it like a story…. Everyday Ramu goes to school by carrying a heavy load of ….. with the users as characters using the artifact that you have designed
3. The scenario can be put into a sequence of scenes like that of a comic book.
4. Show the scenario in the form of a slide show

Prototype through 'Concept Video':
1. Use programs that allow you to quickly sequence and animate your ideas in action
Or You could have your friends play-enact as users and video shoot them using/demonstrating the artifact
2. Put the scenario together and play it as a video

Output 5.3a: Rough Prototype in one or many of the above methods

Task 5.3b

Task 5.3b: Feedback from users on rough prototypes

School Hours: 2, Home hours: 2, done either individually or in groups of 2

Topic title:

Feedback from Users

1. Show the mock-up to potential users and get feedback
2. Note down all the remarks
3. Incorporate suggestions from the feedback in your design

Output 5.3b: Make a presentation of these in 3 slides incorporating the summary of the feedback from users

Task 5.3c

Task 5.3c: High fidelity prototypes + Proof of Concept

School Hours: 2, Home hours: 2, done either individually or in groups of 2

Topic title:

High-fidelity prototypes

1. Detail out the final selected concept: the details could be about its layout, form, colours, material selection, production method and specifications
2. Different medias would require different ways of making the high fidelity prototypes:

a. Communication Design in 2D – can be printed at a DTP setup

b. Product Design in 3D – Can be 3D printed after making a3D digital model of the final concept

3. Animation and Video – can be made using a video editing software

Output 5.3c: Make a presentation of these prototypes after incorporating the the feedback from users

Topic title:

Proof of Concept (optional)

1. If your solution involved a demonstration of technology, it is suggested to make a proof of the concept showing your idea works

Output: Demonstration through a proof of concept prototype

Task 5.3d

Task 5.3d: Presentation and Documentation of Stage 3

School Hours: 2, Home hours: 2, done either individually or in groups of 2

Topic title:

Stage 3 Presentation and Documentation:

Output 5.3d: Prepare a presentation (of 6-8 minutes duration) to include the stage 3 of your project:

a. Title of the Design Project or Problem Statement

b. Team members

c. Summary/content listing of your presentation

d. Design Concepts Mock-up prototyping

e. Feedback from users

f. High-fidelity Prototyping + Proof of Concept (optional)

k. Reference

l. Credits

Task 5.4

Task 5.4 = 5.4a + 5.4b + 5.4c
School Hours: 13, and Home hours: 7
- done individually or done collaboratively in groups of 2

5.4 - Stage 4:

Final Presentation + Design Project Report

Task 5.4a

Task 5.4a: Business Model preparation + Design Patenting (optional)
School Hours: 2, Home hours: 2, done either individually or in groups of 2

Topic title:

Business Model

If your solution has the potential of being implemented as a new venture, then prepare a Business Model for the final solution 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

Output: Make use of these points to make a pitch presentation (where you have to present the business viability of the new product)

Topic title:

Utility and Design Patenting

If your solution is innovative and has the potential of being patented, then prepare a proposal to file a patent.
1. Decide if your innovative concept fits in with the Utility Patent or Design Patent
Utility Patent: these include innovative original improvements to making process, materials, machines, technology and manufacturing methods
Design Patent: this includes innovative original form and shape of the designed concept
2. You'll need to file a patent. More information is available at https://ipindia.gov.in/form-and-fees.htm
Output: Patent application filing – first for provisional and then anon-provisional patent

Task 5.4b

Task 5.4a: Final Capstone Design Project Presentation
School Hours: 2, Home hours: 2, done either individually or in groups of 2

Topic title:

Final Presentation

Prepare a presentation (of 15-20 minutes duration) to include all the stages of your project:

a. Title of the 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. Mock-up Prototype/High Fidelity Prototype
j. Proof of Concept Prototype (optional)
k. User feedback on final solution
l. Future steps and suggestions
m. Full References (Learn how to do references)
n. Acknowledgments – to all who have helped
Output 5.4a: A presentation (15-20 minutes, roughly 30 to 40 slides) explaining the Project outcome along with Process + the Business Model for your enterprise (optional)

Task 5.4c

Task 5.4a: Final Capstone Design Project Report
School Hours: 2, Home hours: 2, done either individually or in groups of 2

Topic title:

Final Design Project Documentation Report

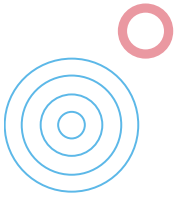
Prepare a report (around 30 to 40 pages) to include all the different stages of your project. The project report will have text for explanations supported by visuals/images.
The project report needs to include the following:
a. Title of the Design Project or Problem Statement
b. Team members
c. Summary/content listing of the report
d. Undertaking that the work is done by you and your team
e. Insights from Primary and Secondary Research
f. Major design opportunities
g. Restatement of the problem / Design Objectives / Design Goals
h. Alternate Concepts (sketches + quick scenarios + concept models)
i. Final Concept and its unique features
j. Process, Form or Interface development and detailing
k. Mock-up Prototype/High Fidelity Prototype
l. Proof of Concept Prototype (optional)
m. User feedback on final solution
n. Future steps and suggestions
o. Full References (Learn how to do references)
p. Acknowledgments – to all who have helped
Output 5.4a: A report (around 30 to 40 pages) explaining the Project outcome along with the steps of the Design Process + the Business Model for your enterprise

Reflection:

Questions to ponder:

- What are the most interesting methods of the Capstone design project that you found useful and interesting in solving the problems?
- 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: Stage 1 – Task 5.1:



Assessment Criteria (Task 5.1) - Assess yourself:

Stage 1 - Task 5.1: Understanding the problem to be solved – Primary and Secondary Research + Analysis of the problem

- The student asked questions and the Mind-map of the chosen topic was done very well. (Group or individual task)

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

- The presentation of the Summary points of the Primary Research was very done well. (Group or individual task)

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

- The presentation of the Summary points of the Secondary Research documentation was very done well. (Group or individual task)

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

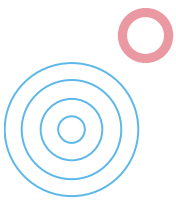
- Analysis of the design problem was done very well with proper categorisation and assigning priorities. (Group or individual task)

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

- The collation/summary of the different stages of this module was presented very well. (Group or individual task)

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

Self Assessment: Stage 2 – Task 5.2:



Assessment Criteria (Task 5.2) – Assess yourself:

Stage 2 – Task 5.2: Ideating, sketching and alternatives + Soft Prototyping

- Is able to identify an appropriate problem and develop a detailed design brief which has all the relevant parameters of the problem. (Group or individual task)

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

- Detailed and well-presented sketch of the possible creative ideas for solution to the problem. (Group or individual task)

☐ ☐ ☐ ☐ ☐

Beginning *Promising* *Excellent*

- The Temporal and Spatial Mappings were done well. (Group or individual task)

☐ ☐ ☐ ☐ ☐

Beginning *Promising* *Excellent*

- The selection of the final idea was very done well. (Group or individual task)

☐ ☐ ☐ ☐ ☐

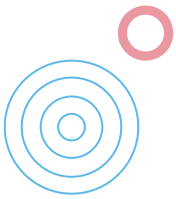
Beginning *Developing* *Promising* *Proficient* *Excellent*

- The presentation of the stage 2 of the project was done well. (Group or individual task

☐ ☐ ☐ ☐ ☐

Beginning *Promising* *Excellent*

Self Assessment: Stage 3 – Task 5.3:



Assessment Criteria (Task 5.3) – Assess yourself:

Stage 3 – Task 5.3: Prototyping, Feedback and Iteration

- Completes a detailed and creative mock-up prototype of the concept. (Group or individual task)

☐ ☐ ☐ ☐ ☐

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

- Gets Feedback from the users on the final concepts. (Group or individual task)

☐ ☐ ☐ ☐ ☐

Beginning *Promising* *Excellent*

- High Fidelity prototype was done well. (Group or individual task)

☐ ☐ ☐ ☐ ☐

Beginning *Promising* *Excellent*

- The presentation of this project was done well. (Group or Individual task)

☐ ☐ ☐ ☐ ☐

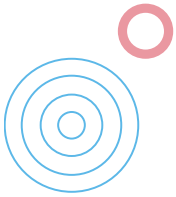
Beginning *Promising* *Excellent*

Self Assessment: Stage 4 – Task 5.4:

Assessment Criteria (Task 5.4) – Assess yourself:

Stage 4 – Task 5.4: Design Project presentation + Project Report

- The collation/summary of the different stages of this module was presented very well. (Group or individual task)



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

- The report on the different stages of this module was documented very well. (Group or individual task)

☐	☐	☐	☐	☐
Beginning		*Promising*		*Excellent*

Other References:

Other suggested References:

1. Design Thinking Process - explained with an example:
https://www.youtube.com/watch?v=uRtAzzitBmA

2. Design Thinking Framework - a short video:
https://www.youtube.com/watch?v=LhQWrHQwYTk

Assessment Matrix:

Module 1.0: Indian Knowledge Systems

Achievement Levels	**1-2 BEGINNING**	**3-4 DEVELOPING**	**5-6 PROMISING**	**7-8 PROFICIENT**	**9-10 EXCELLENT**
Task 1.1a **Abstraction and Form 1** (Individual Assessment)	Abstraction and Form Giving tasks are yet to be done - by Visualisation of the Idea as sketches	Abstraction and Form Giving tasks were just about done by Visualisation of the Idea as sketches	Abstraction and Form Giving tasks were moderatley done by Visualisation of the Idea as sketches	Abstraction and Form Giving tasks were fairly done by Visualisation of the Idea as sketches	Abstraction and Form Giving tasks were done very well by Visualisation of the Idea as sketches
Task 1.1b **Abstraction and Form 2** (Individual Assessment)	Abstraction and Form Giving tasks are yet to be done – by creating an appropriate story and then visualizing it as images	Abstraction and Form Giving tasks were jus about done by creating an appropriate story and then visualizing it as images	Abstraction and Form Giving tasks were moderatley done by creating an appropriate story and then visualizing it as images	Abstraction and Form Giving tasks were fairly done by creating an appropriate story and then visualizing it as images	Abstraction and Form Giving tasks were done very well by creating an appropriate story and then visualizing it as images
Task 1.2a **Elements of Nature 1** (Individual Assessment)	The pictures of articles/things mapping (representation) to each of the elements of nature are yet to be done	The pictures of articles/things mapping (representation) to each of the elements of nature were just about done	The pictures of articles/things mapping (representation) to each of the elements of nature were moderatley done	The pictures of articles/things mapping (representation) to each of the elements of nature were fairly done	The pictures of articles/things mapping (representation) to each of the elements of nature were done very well.
Task 1.2b **Elements of Nature 2** (Individual Assessment)	The mapping (representation) to human body the keywords and the elements of nature are yet to be done	The mapping (representation) to human body the keywords and the elements of nature were just about done	The mapping (representation) to human body the keywords and the elements of nature were moderatley done	The mapping (representation) to human body the keywords and the elements of nature were fairly done	The mapping (representation) to human body the keywords and the elements of nature were done very well.
Task 1.2c **Elements of Nature 3** (Individual Assessment)	The mapping of design principles for organizing the chosen objects in terms of hierarchy is yet to be done	The mapping of design principles for organizing the chosen objects in terms of hierarchy was just about done	The mapping of design principles for organizing the chosen objects in terms of hierarchy was moderatley done	The mapping of design principles for organizing the chosen objects in terms of hierarchy was fairly done	The mapping of design principles for organizing the chosen objects in terms of hierarchy was done very well.

Task 1.3a **Grids and Compositions 1** (Individual Assessment)	The Identification of grids and other factors in sacred architectural spaces is yet to be done	The Identification of grids and other factors in sacred architectural spaces was just about done	The Identification of grids and other factors in sacred architectural spaces was moderatley done	The Identification of grids and other factors in sacred architectural spaces was fairly done	The Identification of grids and other factors in sacred architectural spaces was done very well.
Task 1.3b **Grids and Compositions 3** (Individual Assessment)	The identification of design principles in sculptures is yet to be done	The identification of design principles in sculptures was just about done	The identification of design principles in sculptures was moderatley done	The identification of design principles in sculptures was fairly done	The identification of design principles in sculptures was done very well.
Task 1.4a **Grids and Patterns 1** (Individual Assessment)	The Identification of grids and other factors in Rangoli pattern as well as making of one ia yet to be done	The Identification of grids and other factors in Rangoli pattern as well as making of one was just about done	The Identification of grids and other factors in Rangoli pattern as well as making of one was moderatley done	The Identification of grids and other factors in Rangoli pattern as well as making of one was fairly done	The Identification of grids and other factors in Rangoli pattern as well as making of one was done very well.
Task 1.4b **Grids and Patterns** (Individual Assessment)	The drawing of recurring patterns as fractals ia yet to be done	The drawing of recurring patterns as fractals was just about done	The drawing of recurring patterns as fractals was moderatley done	The drawing of recurring patterns as fractals was fairly done	The drawing of recurring patterns as fractals was done very well.

Assessment Matrix:

Module 2.0: Design for Personal Space

Achievement Levels	**1-2** **BEGINNING**	**3-4** **DEVELOPING**	**5-6** **PROMISING**	**7-8** **PROFICIENT**	**9-10** **EXCELLENT**
Task 2.1a **Observation and Asking Questions** (Individual Assessment)	Observation, Asking Questions and making a mind-map is yet to be done	Observation, Asking Questions and making a mind-map was poorly done	Observation, Asking Questions and making a mind-map was done moderatley well	Observation, Asking Questions and making a mind-map was done fairly well	Observation, Asking Questions and making a mind-map was done very well
Task 2.1b + 2.1c **Primary + Sec Research** (Individual Assessment)	The Primary and secondary research is yet to be done	The Primary and secondary research was poorly done	The Primary and secondary research was done moderatley well	The Primary and secondary research was done fairly well	The Primary and secondary research was done very well
Task 2.1d **Analysis** (Individual Assessment)	The analysis of the personal problem space is yet to be done	The analysis of the personal problem space was poorly done	The analysis of the personal problem space was done moderatley well	The analysis of the personal problem space was done fairly well	The analysis of the personal problem space was done very well
Task 2.2a **Creativity and Alternate Ideas** (Individual Assessment)	Needs to come out with creative innovative alternate ideas along with sketches	Just about comes out with creative innovative alternate ideas along with sketches	Moderately comes out with creative innovative alternate ideas along with sketches	Fairly comes out with creative innovative several alternate ideas along with sketches	Comes out with several creative innovative alternate ideas along with sketches
Task 2.2b **Mock-up Prototype and Feedback**	The mock-up of the prototype of the final concept + feedback needs to be done	The mock-up of the prototype of the final concept + Feedback was just about done	The mock-up of the prototype of the final concept + Feedback was moderately done	The mock-up of the prototype of the final concept + Feedback was fairly done	The mock-up of the prototype of the final concept was done very well incorporating feedback from the users
Task 2.2c **Presentation** (Group Assessment)	The final presentation showing the design process and the final solution needs to be done	The final presentation showing the design process and the final solution was just about done	The final presentation showing the design process and the final solution was moderately done	The final presentation showing the design process and the final solution was fairly done	The final presentation showing the design process and the final solution was done very well

Assessment Matrix:

Module 2.0: Design for Social Spaces

Achievement Levels	**1-2** **BEGINNING**	**3-4** **DEVELOPING**	**5-6** **PROMISING**	**7-8** **PROFICIENT**	**9-10** **EXCELLENT**
Task 3.1a **Observation and Asking Questions** (Individual Assessment)	Observation, Asking Questions and making a mind-map is yet to be done	Observation, Asking Questions and making a mind-map was poorly done	Observation, Asking Questions and making a mind-map was done moderatley well	Observation, Asking Questions and making a mind-map was done fairly well	Observation, Asking Questions and making a mind-map was done very well
Task 3.1b + 2.1c **Primary + Sec Research** (Individual Assessment)	The Primary and secondary research is yet to be done	The Primary and secondary research was poorly done	The Primary and secondary research was done moderatley well	The Primary and secondary research was done fairly well	The Primary and secondary research was done very well
Task 3.1d **Analysis** (Individual Assessment)	The analysis of the personal problem space is yet to be done	The analysis of the personal problem space was poorly done	The analysis of the personal problem space was done moderatley well	The analysis of the personal problem space was done fairly well	The analysis of the personal problem space was done very well
Task 3.2a **Creativity and Alternate Ideas** (Individual Assessment)	Needs to come out with creative innovative alternate ideas along with sketches	Just about comes out with creative innovative alternate ideas along with sketches	Moderately comes out with creative innovative alternate ideas along with sketches	Fairly comes out with creative innovative several alternate ideas along with sketches	Comes out with several creative innovative alternate ideas along with sketches
Task 3.2b **Mock-up Prototype and Feedback**	The mock-up of the prototype of the final concept + feedback needs to be done	The mock-up of the prototype of the final concept + Feedback was just about done	The mock-up of the prototype of the final concept + Feedback was moderately done	The mock-up of the prototype of the final concept + Feedback was fairly done	The mock-up of the prototype of the final concept was done very well incorporating feedback from the users

Assessment Matrix:

Module 3.0: Design for Public Spaces

Achievement Levels	**1-2** **BEGINNING**	**3-4** **DEVELOPING**	**5-6** **PROMISING**	**7-8** **PROFICIENT**	**9-10** **EXCELLENT**
Task 4.1a **Observation and Asking Questions** (Individual Assessment)	Observation, Asking Questions and making a mind-map is yet to be done	Observation, Asking Questions and making a mind-map was poorly done	Observation, Asking Questions and making a mind-map was done moderatley well	Observation, Asking Questions and making a mind-map was done fairly well	Observation, Asking Questions and making a mind-map was done very well
Task 4.1b + 4.1c **Primary + Sec Research** (Individual Assessment)	The Primary and secondary research is yet to be done	The Primary and secondary research was poorly done	The Primary and secondary research was done moderatley well	The Primary and secondary research was done fairly well	The Primary and secondary research was done very well
Task 4.1d **Analysis** (Individual Assessment)	The analysis of the personal problem space is yet to be done	The analysis of the personal problem space was poorly done	The analysis of the personal problem space was done moderatley well	The analysis of the personal problem space was done fairly well	The analysis of the personal problem space was done very well
Task 4.2a **Creativity and Alternate Ideas** (Individual Assessment)	Needs to come out with creative innovative alternate ideas along with sketches	Just about comes out with creative innovative alternate ideas along with sketches	Moderately comes out with creative innovative alternate ideas along with sketches	Fairly comes out with creative innovative several alternate ideas along with sketches	Comes out with several creative innovative alternate ideas along with sketches
Task 4.2b **Mock-up Prototype and Feedback**	The mock-up of the prototype of the final concept + feedback needs to be done	The mock-up of the prototype of the final concept + Feedback was just about done	The mock-up of the prototype of the final concept + Feedback was moderately done	The mock-up of the prototype of the final concept + Feedback was fairly done	The mock-up of the prototype of the final concept was done very well incorporating feedback from the users

Assessment Criteria:

Module 5.1: Capstone Project – Stage 1 – Understanding the Problem Space

Achievement Levels	1-2 BEGINNING	3-4 DEVELOPING	5-6 PROMISING	7-8 PROFICIENT	9-10 EXCELLENT
Ask Questions	The student asked is yet to ask questions and the Mind-map of the chosen topic is yet to be done.	The student asked a few questions and the Mind-map of the chosen topic was just about done.	The student asked some questions and the Mind-map of the chosen topic was somewhat done	The student asked questions and the Mind-map of the chosen topic was done fairly well.	The student asked questions and the Mind-map of the chosen topic was done very well.
Primary Research	The presentation of the Summary points of the Primary Research is yet to be done	The presentation of the Summary points of the Primary Research was just about done	The presentation of the Summary points of the Primary Research was somewhat done	The presentation of the Summary points of the Primary Research was fairly done well	The presentation of the Summary points of the Primary Research was very done well
Secondary Research	The presentation of the Summary points of the Secondary Research documentation is yet to be done	The presentation of the Summary points of the Secondary Research documentation was just about done	The presentation of the Summary points of the Secondary Research documentation was somewhat done	The presentation of the Summary points of the Secondary Research documentation was fairly done well	The presentation of the Summary points of the Secondary Research documentation was very done well
Analysis of the Problem to be solved	Analysis of the design problem is yet to be done with proper categorisation and assigning priorities.	Analysis of the design problem was just about done with proper categorisation and assigning priorities.	Analysis of the design problem was somewhat done with proper categorisation and assigning priorities.	Analysis of the design problem was done fairly well with proper categorisation and assigning priorities.	Analysis of the design problem was done very well with proper categorisation and assigning priorities.
Collating and Presentation	The collation/ summary of the different stages of this module is yet to be presented	The collation/ summary of the different stages of this module was presented just about well	The collation/ summary of the different stages of this module was presented somewhat well	The collation/ summary of the different stages of this module was presented fairly well	The collation/ summary of the different stages of this module was presented very well

Assessment Matrix:

Module 5.2: Capstone Project: Stage 2 - Ideating, sketching and alternatives

Achievement Levels	1-2 BEGINNING	3-4 DEVELOPING	5-6 PROMISING	7-8 PROFICIENT	9-10 EXCELLENT
Redefining or restating the problem	Is able to **identify** a problem and yet to develop a **simple** design brief	Is able to **identify** a problem and develop a **simple** design brief	is able to **identify** a problem and develop a **simple** design brief which has **few** relevant parameters of the problem	Is able to **identify** an **appropriate** problem and develop a design brief which has **some** relevant parameters of the problem	Is able to **identify** an **appropriate** problem and develop a detailed design brief which has **all** the relevant parameters of the problem
Ideation of solutions by sketching	Needs to complete the sketch of the possible ideas for solution to the problem	Completes a basic sketch of the possible ideas for solution to the problem	Completes an average sketch of the possible ideas for solution to the problem	Completes a good sketch of the suitable ideas for solution to the problem	Detailed and well-presented sketch of the possible creative ideas for solution to the problem
Information Mappings – Temporal and Spatial	The Temporal and Spatial Mappings are yet to be done	The Temporal and Spatial Mappings were just about done	The Temporal and Spatial Mappings were somewhat done	The Temporal and Spatial Mappings were fairly done well	The Temporal and Spatial Mappings were done well
Selecting the final Idea	The selection of the final idea is yet to be done	The selection of the final idea was just about done	The selection of the final idea was somewhat done	The selection of the final idea was fairly done well	The selection of the final idea was very done well
Collating and Presentation	The collation/ summary of the different stages of this section is yet to be presented	The collation/ summary of the different stages of this section was presented just about well	The collation/ summary of the different stages of this section was presented somewhat well	The collation/ summary of the different stages of this section was presented fairly well	The collation/ summary of the different stages of this section was presented very well

Assessment Matrix:

Module 5.3: Capstone Project: Stage 3 – Prototyping and Feedback

Achievement Levels	1-2 BEGINNING	3-4 DEVELOPING	5-6 PROMISING	7-8 PROFICIENT	9-10 EXCELLENT
Prototyping	Needs to complete the prototype of one of the problem solution ideas.	Completes a basic prototype of the problem solution idea by using - 2D/3D design Sketches/Physical Prototyping/ Visualisation /3D Models	Completes an average and limited prototype of the problem solution idea by using - 2D/3D design Sketches/Physical Prototyping/ Visualisation /3D Models	Completes a good and appropriate prototype of the problem solution idea by using - 2D/3D design Sketches/Physical Prototyping/ Visualisation /3D Models	Completes a detailed and creative prototype of the problem solution idea by using - 2D/3D design Sketches/Physical Prototyping/ Visualisation /3D Models
Walkthrough	Needs to complete the walkthrough explaining the solution to the problem	The walkthrough explaining the solution to the problem was just about done	The walkthrough explaining the solution to the problem was somewhat done	The walkthrough explaining the solution to the problem was fairly done	The walkthrough explaining the solution to the problem was done well
Testing and Evaluation	Is able to **state** a testing strategy only	Is able to state a testing strategy and is able to **evaluate** the success of the prototype against **few** aspects of design specification.	Is able to state a testing strategy and is able to **evaluate** the success of the prototype against **some aspects** of design specification.	Is able to state a testing strategy and is able to **evaluate** the success of the prototype against **all design** specifications.	Is able to justify a testing strategy and is able to **evaluate** the success of the prototype against **all design** specifications.
Collating and Presentation	The collation/ summary of the different stages of this section is yet to be presented	The collation/ summary of the different stages of this section was presented just about well	The collation/ summary of the different stages of this section was presented somewhat well	The collation/ summary of the different stages of this section was presented fairly well	The collation/ summary of the different stages of this section was presented very well

Assessment Matrix:

Module 5.4: Capstone Project: Stage 4 – Final Presentation and Documentation

Achievement Levels	1-2 BEGINNING	3-4 DEVELOPING	5-6 PROMISING	7-8 PROFICIENT	9-10 EXCELLENT
Collating and Presentation	The collation/ summary of the different stages of this module is yet to be presented (Needs to complete the presentation beyond title and team members)	The collation/ summary of the different stages of this module was presented just about well (A limited presentation covering only a brief summary)	The collation/ summary of the different stages of this module was presented somewhat well (An average presentation with lack of clarity in the flow of ideas and stages undertaken in the project)	The collation/ summary of the different stages of this module was presented fairly well (A fairly good presentation with a logical structure of ideas and stages undertaken in the project.	The collation/ summary of the different stages of this module was presented very well (A detailed and effective presentation covering all stages of the project)
Documentation Report	Needs to complete the documentation report explaining the complete design process for solving the problem	The documentation report explaining the complete design process for solving the problem was just about done	The documentation report explaining the complete design process for solving the problem was somewhat done	The documentation report explaining the complete design process for solving the problem was fairly done	The documentation report explaining the complete design process for solving the problem was done well

Student Feedback Form:

NAME	CLASS	MODULE	TASK	ACTIVITY	DATE
Give a rating for each of the statements below: - by placing a tick mark in the corresponding box.					
	INADEQUATE	**FAIR**	**GOOD**	**VERY GOOD**	**EXCEPTIONAL**
Level of effort you put into activity					
Your level of knowledge at the start of the activity					
Your level of knowledge at the end of the activity					
Understanding of exposure slides/video					
	STRONGLY DISAGREE	**DISAGREE**	**NEUTRAL**	**AGREE**	**STRONGLY AGREE**
I enjoyed doing the activity					
I understood the design principles while doing the task					
I liked trying out different creative variations					
I can apply design thinking process to problem solving					
I enjoyed working in collaboration with my group					
Additional Comments:					
What I liked the most: What can be done better:					
What can be Added/Changed:					

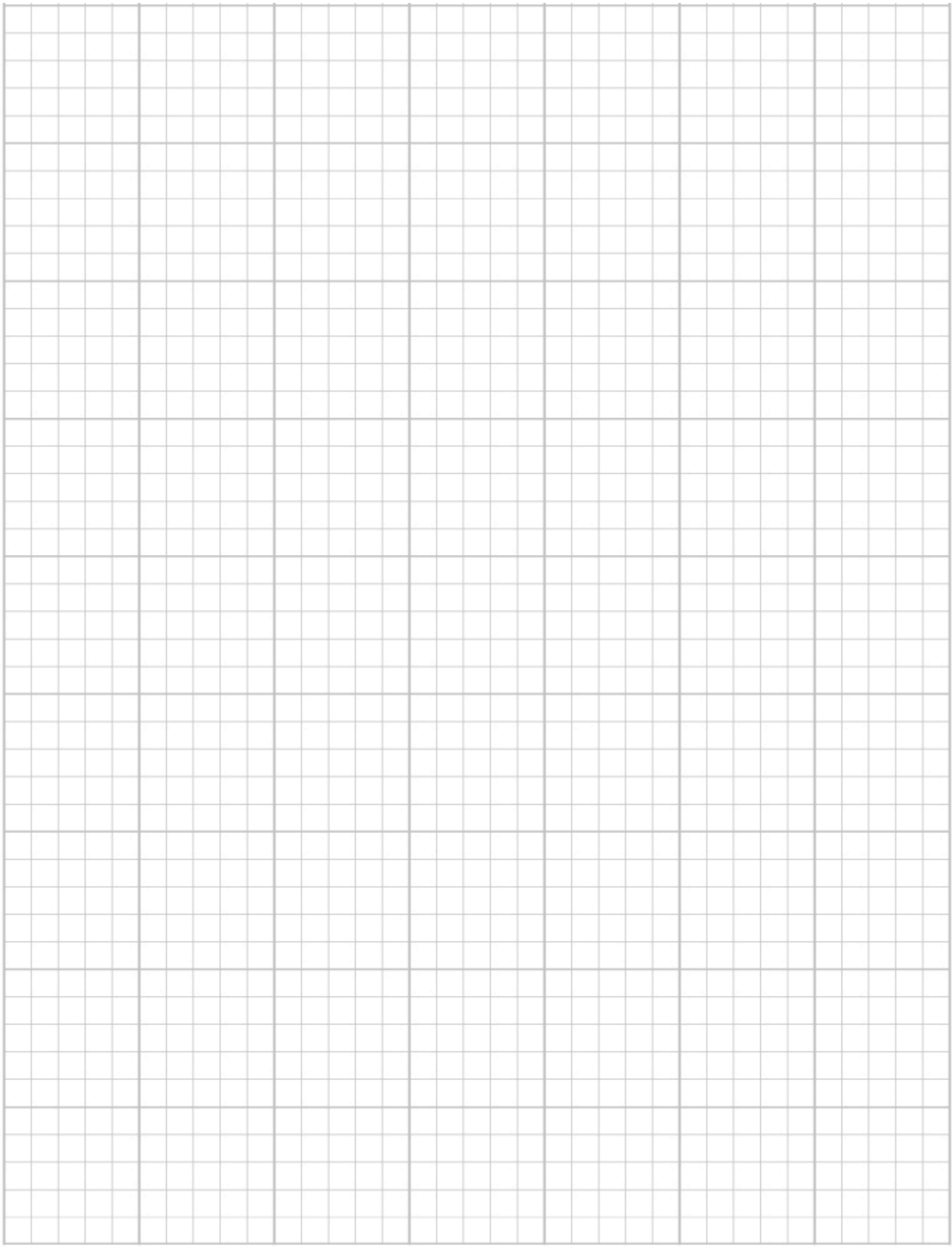
Teacher Feedback Form:

NAME	CLASS	MODULE	TASK	ACTIVITY	DATE

Comments:
- place a tick mark in the corresponding box.

	COMMENTS				
It was easy to deliver the exposure modules:	**STRONGLY DISAGREE**	**DISAGREE**	**NEUTRAL**	**AGREE**	**STRONGLY AGREE**
Your comments:					
It was easy/satisfying/enjoyable to conduct the task activities:	**STRONGLY DISAGREE**	**DISAGREE**	**NEUTRAL**	**AGREE**	**STRONGLY AGREE**
Your comments:					
No issues were faced with regard to assessment of the task:	**STRONGLY DISAGREE**	**DISAGREE**	**NEUTRAL**	**AGREE**	**STRONGLY AGREE**
Your comments					
Common questions posed by the students:					
Suggestions for improving the task or suggestion of another task:					
Other suggestions, if any:					

Grid Layout for Sketching and taking notes:



Credits

Acknowledgement and Credits:

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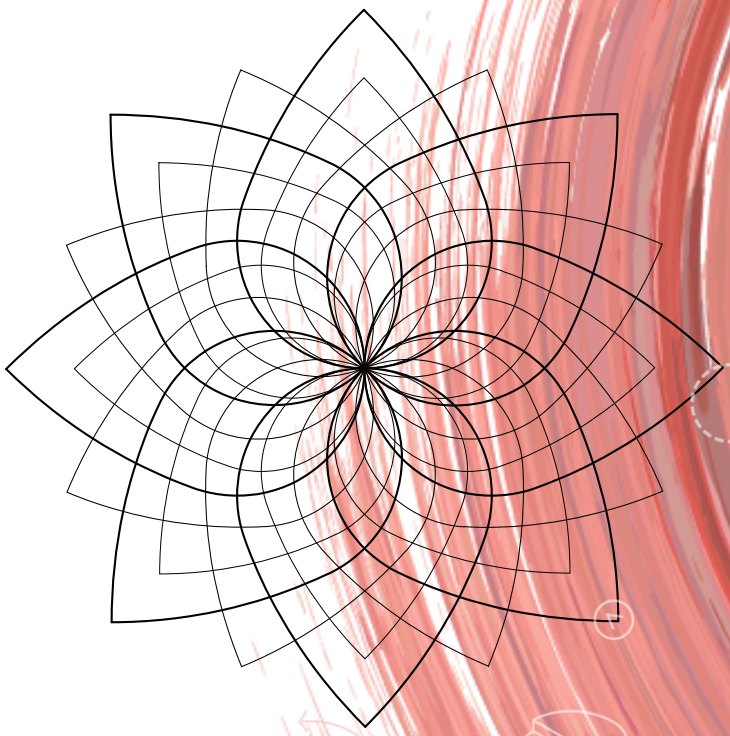
Design Thinking and Innovation

for Grade 12, Semester 1 and 2

Taskbook

2022

Hope you enjoyed the Tasks !!!



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