Jabatan Pendidikan Politeknik & Kolej Komuniti

FREE ELECTIVE GUIDELINES: DESIGN THINKING

Curriculum Division
Dept. of Polytechnic and Community College Education (DPCCE)
Ministry of Education (MOE)

EDITORIAL BOARD

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PREFACE

Design Thinking (DT) was initially introduced to Malaysian polytechnic lecturers in 2014 via the *Conceive-Design-Implement-Operate* (CDIO) initiative between the then Department of Polytechnic Education (DPE) and Singapore Polytechnic (SP).

From 2015 to 2018, more polytechnic lecturers were further trained in DT through the *Innovation Ambassador Development Programme* (IADP) by *Genovasi Malaysia* which was co-sponsored by *Agensi Inovasi Malaysia* (AIM), the Ministry of Higher Education (MoHE) and the Department of Polytechnic Education (DPE).

Realizing the importance of equipping polytechnic lecturers and students with creative and critical thinking skills, the Curriculum Division (CD), DPE, through the Curriculum Evaluation and Innovation Unit (also known by its Malay abbreviation as: UPK), began to mobilize a team of polytechnic DT 'ambassadors' to introduce lecturers and students to Design Thinking skills. From 2016 till 2019, DT workshops have been conducted by polytechnic DT practitioners in Politeknik Ungku Omar (PUO), Politeknik Sultan Azlan Shah (PSAS), Politeknik Sultan Salahuddin Abdul Aziz Shah (PSA), Politeknik Banting (PBS), Politeknik Nilai (PNS), Politeknik Port Dickson (PPD), Politeknik Merlimau (PMM), Politeknik Ibrahim Sultan (PIS), Politeknik Tun Syed Nasir (PTSN), Politeknik Muadzam Shah (PMS), Politeknik Sultan Hj Ahmad Shah (POLISAS), Politeknik Kota Bharu (PKB) and Politeknik Kota Kinabalu (PKK). As a result, many lecturers started to employ Design Thinking in students' assessments and projects.

The signing of the Memorandum of Understanding (MoU) between the Department of Polytechnic & Community College Education (DPCCE) and Singapore Polytechnic (SP) in 2017 introduced polytechnic lecturers and students to a societal dimension of Design Thinking: social innovation via *Learning Express* (LeX).

In the LeX Social Innovation programme, students from *Politeknik Malaysia* and Singapore Polytechnic stayed with a community for a duration of 2 weeks and work together to come up with innovations to improve the community's economic well-being, using the Design Thinking approach.

For their involvement in LeX, the Singapore Polytechnic students are awarded 2 credits by their institution, as the LeX 'project' is a compulsory course entitled *Social Innovation Project* that all year two students in Singapore Polytechnic have to take. To enable *Politeknik Malaysia* students who participate in LeX to obtain credits as well, the Curriculum Evaluation and Innovation Unit (UPK) proposed that these students register for a **free elective course** styled after LeX.

On 22nd April 2019, the Polytechnic Curriculum Board approved the introduction of ***DUD 10012 Design Thinking***, a 2-credit free elective course in polytechnics. For a start, the DT course was piloted by LeX participants in Politeknik Banting (PBS) and Politeknik Tuanku Sultanah Bahiyah (PTSB) starting from the June 2019 academic session. However, other

institutions can also offer the course to their students, subject to the terms and conditions highlighted in this **Free Elective Guidelines.**

The guidelines are developed to help the institution management team and implementers to plan, manage, and implement the Design Thinking free elective course. As such, this guideline is suitable to be referred by deputy directors (academic), Design Thinking coordinators, instructors, and facilitators; academic advisors, and system administrator who are involved as the course providers.

Although utmost effort has been spent to ensure the accuracy of this guideline, as with other education documents, this guideline may be subjected to changes in the policy of the Department of Polytechnic and Community College Education (DPCCE), Ministry of Education, from time to time.

Any queries that is not adequately addressed in this guideline, can be be referred to the Curriculum Evaluation & Innovation Unit (UPK), Curriculum Division, Department of Polytechnic & Community College Education, Ministry of Education, Malaysia.

ABBREVIATIONS

AIM : *Agensi Inovasi Malaysia*

CDIO : *Conceive-Design-Implement-Operate*

CGPA : Cumulative Grade Point Average

CD : Curriculum Division

DT : Design Thinking

DPCCE : Department of Polytechnic and Community College Education

DPE : Department of Polytechnic Education (before the merging)

IADP : *Innovation Ambassador Development Programme*

LeX : *Learning Express*

MoHE : Ministry of Higher Education

SLT : Student Learning Time

SP : Singapore Polytechnic

SPMP : *Sistem Pengurusan Maklumat Politeknik*

TPA : *Timbalan Pengarah (Akademik)* (the Malay term for the Deputy Director of Academic)

UPK : *Unit Penilaian & Inovasi Kurikulum* (the Malay term for the Curriculum Evaluation & Innovation Unit)

1.0 INTRODUCTION

1.1 What is a Free Elective course?

A **Free Elective** course in the polytechnic is an extra or 'top-up' general interest course which does not come under the umbrella of specific programmes. It is different from an **elective course** which is technically a discipline core or specialization course which is offered in one particular programme but is chosen as an elective, by students in another programme. Both free elective and elective courses contribute towards students' Cumulative Grade Point Average (CGPA). A free elective course may not be directly related to a particular programme, but it may complement students' competence in other courses in their programme, for example in the *Final Year Project 1* (FYP1) and *Final Year Project 2* (FYP2) courses. It enables students to pursue their interests in a course which is not directly related to their programme, develop new or specialized skills, and enrich their study experience by exploring an area that is new to them.

1.2 *DUD 10012 Design Thinking*

This guideline must be read together with the course information document *for DUD 10012 Design Thinking.* This course is a **2-credit** free elective course that aims to equip polytechnic students with creative and critical thinking skills via the Design Thinking approach. The approach consists of five iterative phases: *Empathy, Define, Ideate, Prototype and Testing.* Students will apply Design Thinking principles, process and techniques to solve real-world problems and come up with innovative solutions in the form of products, systems or services prototypes. This course has been approved by the Polytechnic Curriculum Board on 22nd April 2019 to be offered to Diploma-level students.

2.0 SPECIAL REQUIREMENTS FOR INSTITUTIONS ASPIRING TO OFFER *DUD 10012 DESIGN THINKING*

DUD 10012 Design Thinking can only be offered if institutions have the following expertise:

2.1 Design Thinking Instructors

Those deemed competent are:

- Lecturers who were trained by *Genovasi Malaysia @ d.school Malaysia* / *Agensi Inovasi Malaysia* (AIM) in the *Innovation Ambassador Development Programme* (IADP) and have been involved in conducting Design Thinking courses and workshops to polytechnic lecturers and students at DPCCE and institutional level.
- Lecturers who were appointed as CDIO Master Trainers by JPPKK and have been involved in conducting Design Thinking courses and workshops to polytechnic lecturers and students at DPCCE and polytechnic level.

- Lecturers who have attended Design Thinking training by *Singapore Polytechnic* (SP) for the *Learning Express* (LeX) programme and have been involved in conducting Design Thinking courses and workshops to polytechnic lecturers and students at DPCCE and institutional level.

- Lecturers who have been certified as *practitioners* by any established Design Thinking School or Design Thinking Association (e.g.: *Design Thinking Association of Malaysia* – DTAM)

2.2 Design Thinking Facilitators

Those deemed competent are:

- Lecturers who have attended any Design Thinking course run by *Genovasi Malaysia*, DPCCE, polytechnics and community colleges.

- Lecturers who have attended the *Design Thinking Competency Path Competency Matrix* **(CPCM)** course organized by DPCCE.

3.0 ROLES AND RESPONSIBILITIES

To ensure the smooth implementation of ***DUD 10012 Design Thinking,*** those of interests (students) and the course providers (lecturers) need to be clear of his or her roles. The roles and responsibilities of each person involved is summarized in the form of a flowchart (refer to *Figure 1.0*).

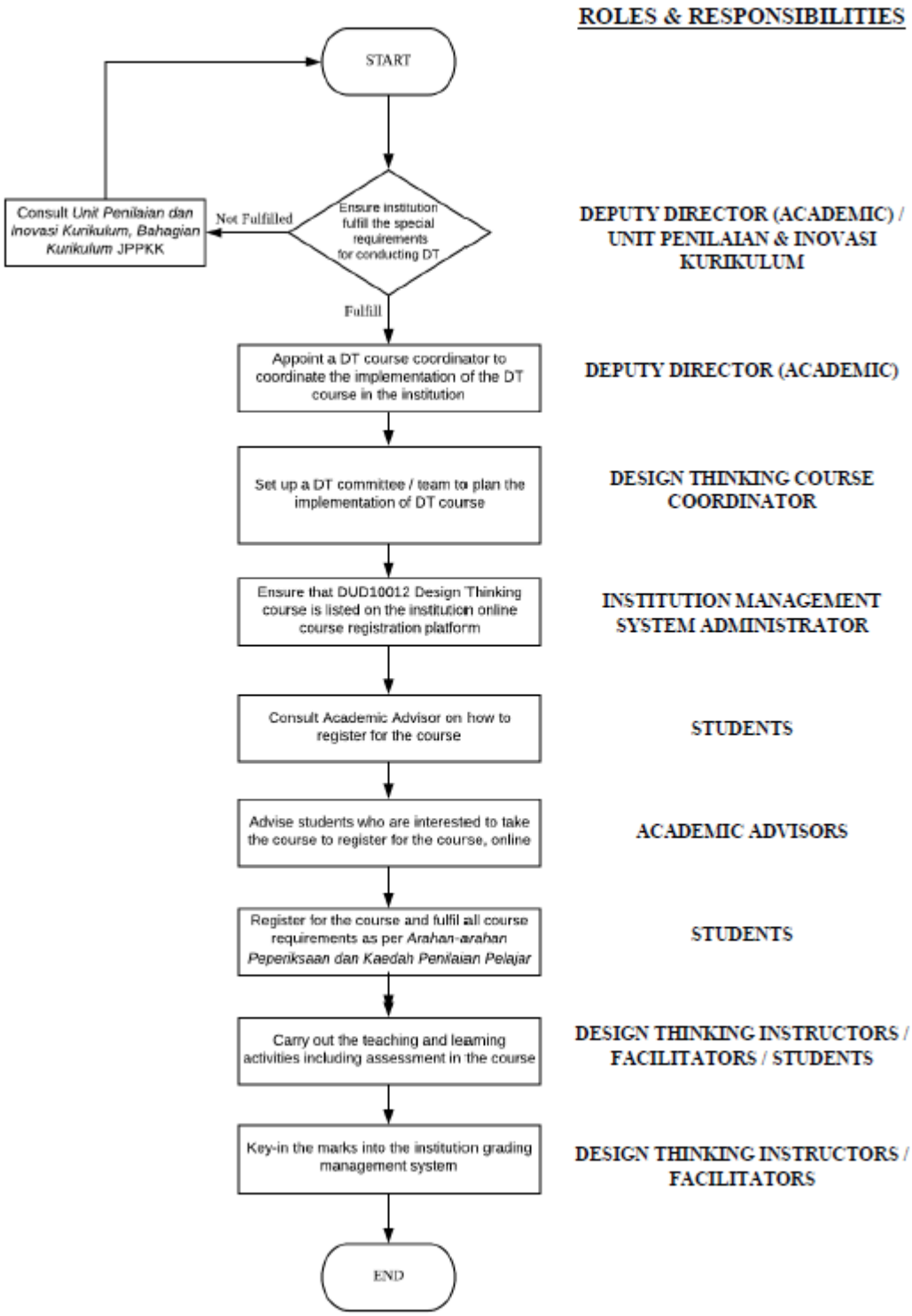

Figure 1.0 The flowchart specifies the roles and responsibilities of interested party (students) and the course providers (lecturers)

3.1 The Deputy Director of Academic

The Deputy Director of Academic (In Malay, *Timbalan Pengarah Akademik*) responsibilities are:

i) to ensure that the special requirements for conducting ***DUD 10012 Design Thinking*** is met before consenting to offer the course in the respective institution.

ii) to consider the expertise, resources and number of students registered for the course before deciding to run the course.

iii) to appoint a suitable person to be the Design Thinking Course Coordinator to act as the officer in charge of the course. Existing CDIO Officer, internally appointed in certain polytechnics can assume this role.

iv) to ensure that students' grades are recorded in the institution's grading management system (such as iPUO and SPMP).

3.2 Design Thinking Course Coordinator

The role of the Design Thinking Course Coordinator is similar to the Head of Unit (In Malay, *Ketua Kursus*) in the General Studies Department in polytechnics.

Their roles are:

i) to liase with the Quality Officer in the polytechnics to obtain copies of the syllabus, to coordinate the ***DUD 10012 Design Thinking*** team

ii) to liase with the Curriculum Evaluation & Innovation Unit (UPK), Curriculum Division, Department of Polytechnic & Community College Education to determine the mapping of the course learning outcomes (CLO) to programme learning outcomes (PLO) in the institution's grading management system.

iii) to lead and supervise the Design Thinking instructors and facilitators (lecturers) in handling this course.

iv) To answer queries pertaining to the implementation of the course in the institution.

3.3 Academic Advisors

Once students have indicated their interest to enrol in the course, the Academic Advisors (In Malay, *Penasihat Akademik*) must advise students accordingly, and inform them to register for the ***DUD 10012 Design Thinking*** course on the online course registration platform (such as *iPUO* and *iDaftar*).

3.4 Institution Management System Administrator

The institution management system administrator (in charge of *iPUO* and *SPMP*) must ensure that ***DUD 10012 Design Thinking*** is listed on the institution online course registration platform so that at the end of students' study, the grades that students attained for this course will be calculated as part of their Cumulative Grade Point Average (CGPA).

3.5 Design Thinking Instructor/s and facilitators (*Pensyarah Kursus*)

The Design Thinking course may require instructor/s to work together with facilitators as a team. The Design Thinking Instructors' role is to lead, provide input, and instruct the students.

The Design Thinking facilitators are expected to assist the Design Thinking instructors in supervising and assessing students. They are expected to key-in the marks into the institution grading management system.

3.6 Students

Students who register for ***DUD 10012 Design Thinking*** are expected to fulfil all the course requirements (including attending classes and completing assessments) in accordance with the current *Arahan-arahan Peperiksaan dan Kaedah Penilaian Pelajar* issued by DPCCE.

4.0 IMPLEMENTATION OF *DUD 10012 DESIGN THINKING*

Before enrolling in a Design Thinking course, students should first consult their Academic Advisor regarding their choice of free elective course when designing their study plan.

4.1 Modes of Implementation

The course could be implemented according to three modes:

4.1.1 The Design Thinking course is proposed as a modular course to cater to Politeknik Malaysia students who take part in the 2-week *Learning Express* (LeX) programme. The experiential nature of this two-credit course enables the course to be compressed and carried out within two (2) weeks (80 SLT hours) of teaching and learning activities. Refer to **Appendix 1** for an example of the implementation plan.

4.1.2 Alternatively, the course could be offered as a modular course during the short semester

4.1.3 Conventionally, it can also be offered as a 14-week course.

4.2 Modes of Registration

There are two registration modes depending on the course implementation mode:

4.2.1 For the LeX modular mode (refer to 4.1.1), to avoid disruptions of the institution information management system (such as *SPMP* and *iPUO*) as the course starts mid semester, the course registration and grading could be done in the following/next semester. The precedent cases for this mode of registration and grading are the *DCG6231* (old code) and *DCG 50201* (new code) *Survey Camp* course from the Diploma in Geomatic programme; and CITRA courses in Universiti Kebangsaan Malaysia (UKM).

4.2.2 For the short semester modular mode (4.1.2) and the conventional 14-week mode (4.1.3), registration must be made at the beginning of the semester as stipulated in *Arahan-Arahan Peperiksaan dan Kaedah Penilaian*.

4.3 Recommended Student Level

It is recommended that the course be offered to Diploma students who are from semester 3 and above.

4.4 Class Arrangement

It is recommended that a class must consist of students who enrol for the course from various departments, and different programmes. This arrangement enables students to work collaboratively using Design Thinking as a strategy in multidisciplinary projects. Institutions should consider the economies of scale when offering the course. It is recommended that there must be at least 15 students enrolled at a particular time.

4.5 Duration

Teaching and Learning (T&L) and assessment need to be completed within 80 hours of Student Learning Time (SLT).

4.6 Stakeholders / Advisors

Ideally, the target users/stakeholders (e.g: community and industry) should be sought/engaged during the *empathy*, *prototyping* and *testing* stages of Design Thinking.

4.7 Grading

Design Thinking facilitators / instructors are expected to evaluate the performance of each students enrolled in this course as specified in Item 15: Assessment (pg. 8), in the Assessment Specification Table (AST) in the ***DUD 10012 Design Thinking*** **Course Information** using the rubrics specified in the Notes of Guidance for Facilitators in **Appendix 2.**

Students are graded as per the current grading system (refer to *Arahan-arahan Peperiksaan dan Kaedah Penilaian Pelajar* issued by DPCCE). Students can refer to the Notes of Guidance for Students in **Appendix 3** to better understand how they will be evaluated.

The grade attained for this course will be calculated as part of Cumulative Grade Point Average (CGPA).

5.0 CONCLUSION

This guideline has captured the essence of the implementation for ***DUD 10012 Design Thinking*** free elective course offered at polytechnics. The course should be able to equip polytechnic students with creative thinking, critical thinking and problem-solving skills, as well as inculcate the design mindset in them. The introduction of free electives in the polytechnic system enables students to learn a course of their own interest which they might not have been able to take previously, due to constraints imposed in the previous the programme structure.

PROGRAMME ITINERARY TEMPLATE			
Week	**Day**	**Time**	**Programme**
Preparation Week	Day 1	9am-4pm	Pre-Council Meeting Master Trainers Design Thinking
	Day 2	9am-4pm	Design Thinking Course for New Facilitators & Polytechnic Lecturers
	Day 3	9am-4pm	First Aid Course for Facilitators
	Day 4	11am-12pm	Meeting with the committee
	Day 5	10.30am	Familiarisation Trip to project site
Week 1	Day 1	8am- 5pm	**Design Thinking Course**
			Explore
			Empathy
	Day 2	8am-5pm	**Design Thinking Course**
			Define, Ideation Prototype & Testing
	Day 3	8am-12pm	Gallery Walk
			Preparation for empathy study at project site
		2pm	**Empathy Study/Homestay Day 1**
			Depart from Polytechnic to project site
			Explore
			Make observations of the project site
			Identify stakeholders to be interviewed
			Immersive activity: Community Stay
	Day 4		**Empathy Study/Homestay Day 2**
			Conduct interviews with the community
			Generate and mine insights
			Immersive activity: Community Stay
	Day 5		**Empathy Study Day 3**
			Conduct interviews
			Generate and mine insights
			Create a persona and craft persona's needs statement
			Depart from project site back to Polytechnic
			Collect locally available or recyclable materials for prototyping, if any.
Week 2	Day 6	8am-5pm	**Ideation**
			Validate insights and needs.
			Presentation - Conduct a mini Gallery Walk to understand each group's insights and persona.
			Get students to continue brainstorming for ideas. Conduct ideation using locally available materials. Guide students on developing the ideas into a concept.

	Day 7	8am-5pm	**Revisit Project | Concept Development | Prototyping**
			Guide students on developing the ideas into a concept
			Facilitate the prototyping stage so students can communicate concepts using prototype(s).
	Day 8	8am-5pm	**Prototyping | Co-creation with (other) users**
			Continue facilitating the prototyping stage so students can communicate concepts using prototype(s).
			Prepare students for co-creation with other users to obtain feedback on their solutions.
	Day 9	8am-5pm	**Co-creation with Users**
			Get students to return to the users for co-creation. Remind students to demonstrate or get users to experiment using the prototypes and obtain feedback.
			Get students to prepare for the Gallery Walk presentation.
	Day 10	8am-12pm	**PRESENTATION - Gallery Walk**
			Project Presentation

LEGEND	
	Preparation Week
	Design Thinking course (80 SLT) carried out within the span of 2 weeks

This sample of implementation plan has been adapted from the Integrated Sociopreneur Innovation Project 2019 (ISIP 2019), Politeknik Port Dickson.

NOTES OF GUIDANCE FOR DUD10012 DESIGN THINKING (FOR FACILITATOR)

1. COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

CLO 1 : Apply design thinking principles, process and techniques to solve a real-world problem innovatively. (C3, CLS 2: Practical Skills)

CLO 2 : Demonstrate the ability to communicate ideas in solving a real-world problem. (A3, CLS 3b: Communication Skills)

2. OBJECTIVES

a. Apply design thinking principles, process and techniques to solve a real-world problem innovatively through the e-Portfolio assessment.

b. Demonstrate the ability to communicate ideas in solving a real-world problem through the Informal Presentation assessments.

3. SCOPE

To meet the course requirements, the facilitator will need to ensure that each group performs the following assessments:

a. E-Portfolio
   i. Progress Post - Photos / Videos with appropriate captions for each DT phase
   ii. Reflection Post - Reflection in written or videos form for each DT phase

b. Informal Presentation
   i. Mini Gallery Walk
   ii. Co-creation session with non-target user
   iii. Co-creation session with target user
   iv. Gallery Walk

4. INSTRUCTIONS

a. The project and assessments must be done in groups as determined by the facilitator within the design thinking course.

b. It is important that the group identifies clear roles and responsibilities, distributing and coordinating various tasks appropriately and is able to operate as a high performing group.

Progress Post

c. Each group must capture clear meaningful photos/videos (minimum 5 photos / videos) with captions to be posted on the Facebook Group as **Progress Post** that reflect every phase of design thinking process.
d. Each group must upload Progress Post with appropriate hashtag (#) to the Facebook Group that has been created by the facilitator for every phase of design thinking process. Eg: #group1kgbandar

Reflection Post

e. Each group must produce a reflection post after they have completed each of phases of design thinking process.
f. A reflection post is groups' response to the experiences, situations, event, new information, thoughts or feelings. Reflections can be in the form of:

i. Videos
- Video must be titled according to phase. (eg: Reflection Post: Empathy-Kg Bandar-Group1)
- Maximum duration is 2 minutes for each phase.

OR;

ii. Written
- Write in one paragraph only (minimum 100 words) for each phases

g. Each group must upload reflection post to the Facebook Group that has been assigned with hashtag (#) according to project name given by the facilitator. Eg: #group1kgbandar

Informal Presentation

h. Each group must be prepared to demonstrate their ability to communicate ideas in solving target users' problem.
i. There will be 4 informal presentations that each group will be assessed on as stated in the Table 1.

j. Table 1 are the tasks and assessments that each group need to accomplish according to the phases of design thinking process.

Table 1: Tasks and assessment to be accomplished based on design thinking phases

PHASE	TASKS	ASSESSMENT
Phase 1 : Sense and Sensibility	• Clarify the project challenge • Select target group of users • Use a suitable analysis technique such as STEEP / SWOT / PEST / PESTEL • Prepare project intent using appropriate project canvas	i. Progress Post ii. Reflection Post
Phase 2 : Empathy	• Practice field observation using observation tools such as POEMS (People, Object, Environment, Messages and Services) framework to understand and observe users' needs and experience • Engage users using in-depth interview protocol and empathy map • Immerse by participating directly in the daily lives / activities of the target users	i. Progress Post ii. Reflection Post
Phase 3 : Define	• Unpack the collected data using SPICE (Social, Physical, Identity, Communication, Emotional) Framework • Organise collected data into clusters to draw insights • Ascertain the needs of the target users • Construct a need statement • Display persona information by using a persona template • Produce the Point-of-View (POV) based on the persona • Clarify the POV with the target users	i. Progress Post ii. Reflection Post iii. Mini Gallery Walk (Informal Presentation 1)
Phase 4: Ideate	• Conduct ideation phase using appropriate ideation tools (eg: SCAMPER / Morphological Matrix / Brainstorming / Superhero) • Select the best idea using an evaluation matrix	i. Progress Post ii. Reflection Post

Phase 5: Prototype	• Select the appropriate method of prototyping (eg: simulation / wireframe / sketching / paper / physical prototype / user journey / story board) • Construct the appropriate low-fidelity prototype	i. Progress Post ii. Reflection Post
Phase 6: Testing	• Show the prototype to allow users to experience for testing • Gather feedbacks from users using the feedback grid • Ascertain the feedbacks • Iterate the design thinking process where necessary	i. Progress Post ii. Reflection Post iii. Co-creation session with non-target user (Informal Presentation 2) iv. Co-creation session with target user (Informal Presentation 3) v. Gallery Walk (Informal Presentation 4)

5. E-PORTFOLIO RUBRIC

The table below are the rubrics for E-Portfolio assessment in each of design thinking process:

RUBRIC FOR PHASE 1: SENSE AND SENSIBILITY					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Identification of target group of users	Able to identify the target group of users independently	Able to identify the target group of users with minor support	Able to identify the target group of users with major support	Have difficulty to identify the target group of users	No attempt
Technique for information acquiring and analysis	Demonstrates a substantial use of a variety of techniques.	Demonstrates a satisfactory use of a technique.	Demonstrates a limited use of technique.	Demonstrates little evidence that any technique was used.	No attempt
Prepare project intent	Expressing by valuing and sharing the information gained excellently	Expressing by valuing and sharing the information gained clearly	Expressing by valuing and sharing the information gained moderately	Expressing by valuing and sharing the information gained minimally	No attempt
Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning.	The reflection explains the student's thinking about his/her own learning processes.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process.	The reflection does not address the student's thinking and/or learning.	No attempt

RUBRIC FOR PHASE 2: EMPATHY					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Observation	Demonstrate an extensive use of observation tools such as POEMS (People, Object, Environment, Messages and Services) framework to understand and observe users' needs and experience.	Demonstrate a substantial use of observation tools such as POEMS (People, Object, Environment, Messages and Services) framework to understand and observe users' needs and experience.	Demonstrate a satisfactory use of observation tools such as POEMS (People, Object, Environment, Messages and Services) framework to understand and observe users' needs and experience.	Demonstrate limited use of observation tools to understand and observe users' needs and experience.	No attempt
Engagement	Fully engage users using in-depth interview protocol and empathy map.	Generally engage users using in-depth interview protocol and empathy map.	Occasionally engage users using in-depth interview protocol and empathy map.	Little to no engagement of the users using in-depth interview protocol and empathy map.	No attempt.
Immersion	Immerse by actively participating directly in the daily lives/activities of the target users.	Immerse by generally participating in the daily lives/activities of target users.	Sometimes participate in the daily lives/activities of target users.	Rarely participate in the daily lives/activities of target users.	No attempt
Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning.	The reflection explains the student's thinking about his/her own learning processes.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process.	The reflection does not address the student's thinking and/or learning.	No attempt

RUBRIC FOR PHASE 3: DEFINE					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Student unpack data from empathy study 1. Transcribing 2. Sharing 3. Synthesizing 4. Discuss and clustering	Student able to unpack data excellently by organize, analyse and evaluate the information they have gathered.	Student able to unpack data satisfactorily by organize, analyse and evaluate the information they have gathered.	Student able to unpack data moderately by organize, analyse and evaluate the information they have gathered.	Students attempt to organize, analyse and evaluate the information they have gathered but have limited success in doing so.	No attempt
Generating insight	Insight excellently defined	Insight is well-defined	Insight is moderately defined	Insight is not well-defined	No attempt
Need Statement	Students develop an excellent need statement, which is clear and concise.	Students develop a satisfactory need statement.	Students develop a moderate need statement.	Students attempt to develop a need statement but have limited success in doing so.	No attempt.
POV/ Persona The persona is created based on their insights that can accurately help them to focus on designing solutions	Students develop an excellent persona. It helps them to accurately understand the user's needs, behaviours, experiences, and goal.	Students develop a satisfactory persona. It helps them better understand the user's needs behaviours, experiences, and goal.	Students develop an average persona. It fairly helps them to understand the user's needs, behaviours, experiences, and goal.	Students attempt to develop an abstract representation of group of users but have limited success in doing so.	No attempt

Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning. The reflection articulates multiple connections between this learning experience and content from other courses, past learning, life experiences and/or future goals.	The reflection explains the student's thinking about his/her own learning processes. The reflection articulates connections between this learning experience and content from other courses, past learning experiences, and/or future goals.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process. The reflection attempts to articulate connections between this learning experience and content from other courses, past learning experiences, or personal goals, but the connection is vague and/or unclear.	The reflection does not address the student's thinking and/or learning. The reflection does not articulate any connection to other learning or experiences.	No attempt

RUBRIC FOR PHASE 4: IDEATION					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Ideation tools	Demonstrate an extensive use, appropriate and effective tools to thoroughly explore ideas. Concepts are thoroughly developed.	Demonstrate a substantial use, appropriate and effective tools to thoroughly explore ideas. Concepts are clearly developed.	Demonstrate a satisfactory use, appropriate and effective tools to thoroughly explore ideas. Concepts are moderately developed.	Little or no effort has been made to move beyond or strengthen initial idea	No attempt
Range of potential solutions	Excellent amount of ideas ranging from very practical to very difficult (if not impossible) to implement	Satisfactory amount of ideas ranging from very practical to very difficult (if not impossible) to implement	Moderate amount of ideas ranging from very practical to very difficult (if not impossible) to implement	Few ideas generated	No attempt
Idea Selection	Demonstrate an extensive use, appropriate and effective idea selection tools to thoroughly evaluate ideas.	Demonstrate a substantial use, appropriate and effective idea selection tools to evaluate ideas.	Demonstrate a satisfactory use, appropriate and effective idea selection tools to evaluate ideas.	Little effort has been made to evaluate ideas.	No attempt
Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning. The reflection articulates multiple connections between this learning experience and content from other courses, past learning, life experiences and/or future goals.	The reflection explains the student's thinking about his/her own learning processes. The reflection articulates connections between this learning experience and content from other courses, past learning experiences, and/or future goals.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process. The reflection attempts to articulate connections between this learning experience and content from other courses, past learning experiences, or personal goals, but the connection is vague and/or unclear.	The reflection does not address the student's thinking and/or learning. The reflection does not articulate any connection to other learning or experiences.	No attempt

RUBRIC FOR PHASE 5: PROTOTYPING					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Prototype Selection	Demonstrate an excellent and effective prototype method to thoroughly represent the idea.	Demonstrate a satisfactory and clear prototype method to represent the idea.	Demonstrate a moderate prototype method to represent the idea.	Demonstrate a prototype with little effort to represent the idea.	No attempt
Features	The prototype display excellent features, characteristics and functionality	The prototype display satisfactory features, characteristics and functionality	The prototype display moderate features, characteristics and functionality	The prototype display poor features, characteristics and functionality	No attempt
Appropriateness to target user Usability appropriate to target user	Prototype is well designed for target user	Prototype is satisfactory designed for target user	Prototype is moderately designed for target user	Prototype poorly designed without well-defined target user in mind	No attempt
Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning. The reflection articulates multiple connections between this learning experience and content from other courses, past learning, life experiences and/or future goals.	The reflection explains the student's thinking about his/her own learning processes. The reflection articulates connections between this learning experience and content from other courses, past learning experiences, and/or future goals.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process. The reflection attempts to articulate connections between this learning experience and content from other courses, past learning experiences, or personal goals, but the connection is vague and/or unclear.	The reflection does not address the student's thinking and/or learning. The reflection does not articulate any connection to other learning or experiences.	No attempt

RUBRIC FOR PHASE 6: TESTING					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Demonstrates Functionality	Prototype works fully and completely. Group clearly demonstrates improvement in this iteration.	Prototype work. Some improvement.	Prototype work sufficiently for user's needs, some lack of functionality. Little improvement in prototype function.	Major part of prototype incorrect or incomplete.	No attempt
Product Testing	User fully understood the usage of prototype and meets their need.	User clearly understood the usage of prototype and meets their need.	User partially understood the usage of prototype and partially meets their need.	User understood the usage of prototype but does not meet their need.	No attempt
Feedback and Iteration	Student engaged in a reflective and iterative design process. Student sought out opportunities to evaluate effectiveness.	Students made appropriate revisions to ideas or designs in response to feedback opportunities that were required / scheduled.	Some revision was attempted in response to feedback.	No revision was attempted in response to feedback.	No attempt
Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning. The reflection articulates multiple connections between this learning experience and content from other courses, past learning, life experiences and/or future goals.	The reflection explains the student's thinking about his/her own learning processes. The reflection articulates connections between this learning experience and content from other courses, past learning experiences, and/or future goals.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process. The reflection attempts to articulate connections between this learning experience and content from other courses, past learning experiences, or personal goals, but the connection is vague and/or unclear.	The reflection does not address the student's thinking and/or learning. The reflection does not articulate any connection to other learning or experiences.	No attempt

MARK SHEET FOR E-PORTFOLIO (60%)		
Village Name:		
Group Name:		
Facilitator Name:	**1.**	
	2.	
	3.	
Student Names:	**1.**	
	2.	
	3.	
	4.	
	5.	
ASPECTS		**MARKS**
PHASE 1: SENSE AND SENSIBILITY		**/16**
PHASE 2: EMPATHY		**/16**
PHASE 3: DEFINE		**/20**
PHASE 4: IDEATION		**/16**
PHASE 5: PROTOTYPING		**/16**
PHASE 6: TESTING		**/16**
TOTAL MARKS		**/100 X 60% =**

6. INFORMAL PRESENTATION RUBRIC

The table below are the rubrics for Informal Presentation assessment at four (4) stages of DT process:

COMMUNICATION SKILLS RUBRIC FOR DEFINE MINI GALLERY WALK				
DIMENSION	**EXCELLENT**	**GOOD**	**FAIR**	**MARKS**
	3	**2**	**1**	
DEFINE	Able to unpack collected data **efficiently**	Able to unpack collected data **satisfactorily**	Able to unpack collected data **moderately**	**/3**
	Describe persona **clearly**	Able to describe persona **adequately**	Able to describe persona **moderately**	**/3**
	Able to clarify P.O.V **excellently** to the team members and facilitators	Able to clarify P.O.V **satisfactorily** to the team members and facilitators	Able to clarify P.O.V **moderately** to the team members and facilitators	**/3**
			TOTAL	**/9**

COMMUNICATION SKILLS RUBRIC FOR CO-CREATION WITH NON-TARGET USERS				
DIMENSION	**EXCELLENT**	**GOOD**	**FAIR**	**MARKS**
	3	**2**	**1**	
CO-CREATION WITH NON TARGET USERS Respond and justify Utilizing feedback	Able to respond to **all** the queries and suggestion received	Able to respond to **several** of the queries and suggestion received	Able to respond to a **few** of the queries and suggestion received	**/3**
	Able to justify to **all** the queries and suggestion received	Able to justify to **several** of the queries and suggestion received	Able to justify a **few** of the queries and suggestion received	**/3**
	Able to utilize **a lot** meaningful of feedbacks	Able to utilize **several** meaningful feedbacks	Able to utilize a **few** meaningful feedbacks	**/3**
			TOTAL	**/9**

COMMUNICATION SKILLS RUBRIC FOR CO-CREATION WITH TARGET USERS				
DIMENSION	**EXCELLENT**	**GOOD**	**FAIR**	**MARKS**
	3	**2**	**1**	
CO-CREATION WITH TARGET USERS Respond and justify	Able to respond to **all** the queries and suggestion received	Able to respond to **several** of the queries and suggestion received	Able to respond to a **few** of the queries and suggestion received	**/3**
	Able to justify to **all** the queries and suggestion received	Able to justify to **several** of the queries and suggestion received	Able to justify a **few** of the queries and suggestion received	**/3**
	Able to utilize **a lot** meaningful of feedbacks	Able to utilize **several** meaningful feedbacks	Able to utilize a **few** meaningful feedbacks	**/3**
Utilizing feedback	Able to engage appropriately with target user	Able to engage satisfactorily with target user	Able to engage but hesitantly with target user	**/3**
			TOTAL	**/12**

COMMUNICATION SKILLS RUBRIC FOR GALLERY WALK					
NO.	**ASSESSMENT CRITERIA**	**EXCELLENT (3)**	**GOOD (2)**	**POOR (1)**	**MARKS**
1.	**Description and explanation about the prototype (type of product/service/ system, function of prototype) for the project.**	Main points are **very clear** and very detailed. Information is directly link to the project.	Main points are **somewhat clear** but could use more detail. More information is link to the project.	Lack of main points. Lacks connection to the project.	/3
2.	**What are the problems faced by the target user?**	Main points are **very clear** and very detailed. Information is directly link to the project.	Main points are **somewhat clear** but could use more detail. More information is link to the project.	Lack of main points. Lacks connection to the project.	/3
3.	**Explain how you came up with this solution**	Main points are **very clear** and very detailed. Information is directly link to the project.	Main points are **somewhat clear** but could use more detail. More information is link to the project.	Lack of main points. Lacks connection to the project.	/3
4.	**What were the feedbacks received from the end user about your prototype?**	Main points are **very clear** and very detailed. Information is directly link to the project	Main points are **somewhat clear** but could use more detail. More information is link to the project.	Lack of main points. Lacks connection to the project.	/3
5.	**From the input received, what improvement has been done to your prototype?**	Main points are **very clear** and very detailed. Information is directly link to the project	Main points are **somewhat clear** but could use more detail. More information is link to the project.	Lack of main points. Lacks connection to the project.	/3
				TOTAL	**/15**

MARK SHEET FOR PRESENTATION (40%)		
Village Name:		
Group Name:		
Facilitator Name:	**1.**	
	2.	
	3.	
Student Name:	**1.**	
	2.	
	3.	
	4.	
	5.	
ASPECTS		**MARKS**
MINI GALLERY WALK		**/9**
CO-CREATION SESSION WITH NON-TARGET USER		**/9**
CO-CREATION SESSION WITH TARGET USER		**/12**
GALLERY WALK		**/15**
TOTAL MARKS		**/45 X 40% =**

NOTES OF GUIDANCE FOR DUD10012 DESIGN THINKING (FOR STUDENT)

1. COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, you should be able to:

CLO 1 : Apply design thinking principles, process and techniques to solve a real-world problem innovatively. (C3, CLS 2: Practical Skills)

CLO 2 : Demonstrate the ability to communicate ideas in solving a real-world problem. (A3, CLS 3b: Communication Skills)

2. OBJECTIVES

a. Apply design thinking principles, process and techniques to solve a real-world problem innovatively through the e-Portfolio assessment.
b. Demonstrate the ability to communicate ideas in solving a real-world problem through the Informal Presentation assessments.

3. SCOPE

To meet the course requirements, you will need to performs the following assessments:

a. E-Portfolio
    i. Progress Post - Photos / Videos with appropriate captions for each DT phase
    ii. Reflection Post - Reflection in written or videos form for each DT phase

b. Informal Presentation
    i. Mini Gallery Walk
    ii. Co-creation session with non-target user
    iii. Co-creation session with target user
    iv. Gallery Walk

4. INSTRUCTIONS

a. The project is to be done in groups as determined by the facilitator within the design thinking course.
b. It is important that your group identifies clear roles and responsibilities, distributing and coordinating various tasks appropriately and is able to operate as a high performing group.

Progress Post

c. You must capture clear meaningful photos/videos (minimum 5 photos / videos) with captions to be posted on the Facebook Group as **Progress Post** that reflect every phase of design thinking process.

d. You must upload Progress Post with appropriate hashtag (#) to the Facebook Group that has been created by the facilitator for every phase of design thinking process. Eg: #group1kgbandar

Reflection Post

e. You must produce a reflection post after you have completed each of phases of design thinking process.
f. A reflection post is your response to the experiences, situations, event, new information, thoughts or feelings. Reflections can be in the form of:

i. Videos
- Video must be titled according to phase.
- Maximum duration is 2 minutes for each phase. (eg: Reflection Post: Empathy-Kg Bandar-Group1)

OR;

ii. Written
- Write in one paragraph only (minimum 100 words) for each phases

g. Upload your reflection post to the Facebook Group that has been assigned to you with hashtag (#) according to project name given by your facilitator. Eg: #group1kgbandar

Informal Presentation

h. You must be prepared to demonstrate your ability to communicate ideas in solving target users' problem.
i. There will be 4 informal presentations that you will be assessed on as stated in Table 1.

j. Table 1 show the tasks and assessments that you need to follow according to the phases of design thinking process.

Table 1: Tasks and assessment to be accomplished based on design thinking phases

PHASE	TASKS	ASSESSMENT
Phase 1 : Sense and Sensibility	• Clarify the project challenge • Select target group of users • Use a suitable analysis technique such as STEEP / SWOT / PEST / PESTEL • Prepare project intent using appropriate project canvas	i. Progress Post ii. Reflection Post
Phase 2 : Empathy	• Practice field observation using observation tools such as POEMS (People, Object, Environment, Messages and Services) framework to understand and observe users' needs and experience • Engage users using in-depth interview protocol and empathy map • Immerse by participating directly in the daily lives / activities of the target users	i. Progress Post ii. Reflection Post
Phase 3 : Define	• Unpack the collected data using SPICE (Social, Physical, Identity, Communication, Emotional) Framework • Organise collected data into clusters to draw insights • Ascertain the needs of the target users • Construct a need statement • Display persona information by using a persona template • Produce the Point-of-View (POV) based on the persona • Clarify the POV with the target users	i. Progress Post ii. Reflection Post iii. Mini Gallery Walk (Informal Presentation 1)
Phase 4: Ideate	• Conduct ideation phase using appropriate ideation tools (eg: SCAMPER / Morphological Matrix / Brainstorming / Superhero) • Select the best idea using an evaluation matrix	i. Progress Post ii. Reflection Post
Phase 5: Prototype	• Select the appropriate method of prototyping (eg: simulation /	i. Progress Post ii. Reflection Post

	wireframe / sketching / paper / physical prototype / user journey / story board) • Construct the appropriate low-fidelity prototype	
Phase 6: Testing	• Show the prototype to allow users to experience for testing • Gather feedbacks from users using the feedback grid • Ascertain the feedbacks • Iterate the design thinking process where necessary	i. Progress Post ii. Reflection Post iii. Co-creation session with non-target user (Informal Presentation 2) iv. Co-creation session with target user (Informal Presentation 3) v. Gallery Walk (Informal Presentation 4)

5. E-PORTFOLIO RUBRIC

The table below are the rubrics for e-Portfolio assessment in each of design thinking process:

RUBRIC FOR PHASE 1: SENSE AND SENSIBILITY					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Identification of target group of users	Able to identify the target group of users independently	Able to identify the target group of users with minor support	Able to identify the target group of users with major support	Have difficulty to identify the target group of users	No attempt
Technique for information acquiring and analysis	Demonstrates a substantial use of a variety of techniques.	Demonstrates a satisfactory use of a technique.	Demonstrates a limited use of technique.	Demonstrates little evidence that any technique was used.	No attempt
Prepare project intent	Expressing by valuing and sharing the information gained excellently	Expressing by valuing and sharing the information gained clearly	Expressing by valuing and sharing the information gained moderately	Expressing by valuing and sharing the information gained minimally	No attempt
Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning.	The reflection explains the student's thinking about his/her own learning processes.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process.	The reflection does not address the student's thinking and/or learning.	No attempt

RUBRIC FOR PHASE 2: EMPATHY					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Observation	Demonstrate an extensive use of observation tools such as POEMS (People, Object, Environment, Messages and Services) framework to understand and observe users' needs and experience.	Demonstrate a substantial use of observation tools such as POEMS (People, Object, Environment, Messages and Services) framework to understand and observe users' needs and experience.	Demonstrate a satisfactory use of observation tools such as POEMS (People, Object, Environment, Messages and Services) framework to understand and observe users' needs and experience.	Demonstrate limited use of observation tools to understand and observe users' needs and experience.	No attempt
Engagement	Fully engage users using in-depth interview protocol and empathy map.	Generally engage users using in-depth interview protocol and empathy map.	Occasionally engage users using in-depth interview protocol and empathy map.	Little to no engagement of the users using in-depth interview protocol and empathy map.	No attempt.
Immersion	Immerse by actively participating directly in the daily lives/activities of the target users.	Immerse by generally participating in the daily lives/activities of target users.	Sometimes participate in the daily lives/activities of target users.	Rarely participate in the daily lives/activities of target users.	No attempt
Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning.	The reflection explains the student's thinking about his/her own learning processes.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process.	The reflection does not address the student's thinking and/or learning.	No attempt

RUBRIC FOR PHASE 3: DEFINE					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Student unpack data from empathy study 1. Transcribing 2. Sharing 3. Synthesizing 4. Discuss and clustering	Student able to unpack data excellently by organize, analyse and evaluate the information they have gathered.	Student able to unpack data satisfactorily by organize, analyse and evaluate the information they have gathered.	Student able to unpack data moderately by organize, analyse and evaluate the information they have gathered.	Students attempt to organize, analyse and evaluate the information they have gathered but have limited success in doing so.	No attempt
Generating insight	Insight excellently defined	Insight is well-defined	Insight is moderately defined	Insight is not well-defined	No attempt
Need Statement	Students develop an excellent need statement, which is clear and concise.	Students develop a satisfactory need statement.	Students develop a moderate need statement.	Students attempt to develop a need statement but have limited success in doing so.	No attempt.
POV/ Persona The persona is created based on their insights that can accurately help them to focus on designing solutions	Students develop an excellent persona. It helps them to accurately understand the user's needs, behaviours, experiences, and goal.	Students develop a satisfactory persona. It helps them better understand the user's needs behaviours, experiences, and goal.	Students develop an average persona. It fairly helps them to understand the user's needs, behaviours, experiences, and goal.	Students attempt to develop an abstract representation of group of users but have limited success in doing so.	No attempt
Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning.	The reflection explains the student's thinking about his/her own learning processes.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process.	The reflection does not address the student's thinking and/or learning.	No attempt

	The reflection articulates multiple connections between this learning experience and content from other courses, past learning, life experiences and/or future goals.	The reflection articulates connections between this learning experience and content from other courses, past learning experiences, and/or future goals.	The reflection attempts to articulate connections between this learning experience and content from other courses, past learning experiences, or personal goals, but the connection is vague and/or unclear.	The reflection does not articulate any connection to other learning or experiences.	

RUBRIC FOR PHASE 4: IDEATION					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Ideation tools	Demonstrate an extensive use, appropriate and effective tools to thoroughly explore ideas. Concepts are thoroughly developed.	Demonstrate a substantial use, appropriate and effective tools to thoroughly explore ideas. Concepts are clearly developed.	Demonstrate a satisfactory use, appropriate and effective tools to thoroughly explore ideas. Concepts are moderately developed.	Little or no effort has been made to move beyond or strengthen initial idea	No attempt
Range of potential solutions	Excellent amount of ideas ranging from very practical to very difficult (if not impossible) to implement	Satisfactory amount of ideas ranging from very practical to very difficult (if not impossible) to implement	Moderate amount of ideas ranging from very practical to very difficult (if not impossible) to implement	Few ideas generated	No attempt
Idea Selection	Demonstrate an extensive use, appropriate and effective idea selection tools to thoroughly evaluate ideas.	Demonstrate a substantial use, appropriate and effective idea selection tools to evaluate ideas.	Demonstrate a satisfactory use, appropriate and effective idea selection tools to evaluate ideas.	Little effort has been made to evaluate ideas.	No attempt
Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning. The reflection articulates multiple connections between this learning experience and content from other courses, past learning, life experiences and/or future goals.	The reflection explains the student's thinking about his/her own learning processes. The reflection articulates connections between this learning experience and content from other courses, past learning experiences, and/or future goals.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process. The reflection attempts to articulate connections between this learning experience and content from other courses, past learning experiences, or personal goals, but the connection is vague and/or unclear.	The reflection does not address the student's thinking and/or learning. The reflection does not articulate any connection to other learning or experiences.	No attempt

RUBRIC FOR PHASE 5: PROTOTYPING					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Prototype Selection	Demonstrate an excellent and effective prototype method to thoroughly represent the idea.	Demonstrate a satisfactory and clear prototype method to represent the idea.	Demonstrate a moderate prototype method to represent the idea.	Demonstrate a prototype with little effort to represent the idea.	No attempt
Features	The prototype display excellent features, characteristics and functionality	The prototype display satisfactory features, characteristics and functionality	The prototype display moderate features, characteristics and functionality	The prototype display poor features, characteristics and functionality	No attempt
Appropriateness to target user Usability appropriate to target user	Prototype is well designed for target user	Prototype is satisfactory designed for target user	Prototype is moderately designed for target user	Prototype poorly designed without well-defined target user in mind	No attempt
Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning. The reflection articulates multiple connections between this learning experience and content from other courses, past learning, life experiences and/or future goals.	The reflection explains the student's thinking about his/her own learning processes. The reflection articulates connections between this learning experience and content from other courses, past learning experiences, and/or future goals.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process. The reflection attempts to articulate connections between this learning experience and content from other courses, past learning experiences, or personal goals, but the connection is vague and/or unclear.	The reflection does not address the student's thinking and/or learning. The reflection does not articulate any connection to other learning or experiences.	No attempt

RUBRIC FOR PHASE 6: TESTING					
DIMENSION	**EXCELLENT**	**VERY GOOD**	**GOOD**	**FAIR**	**NO ATTEMPT**
SCORE	**4**	**3**	**2**	**1**	**0**
Demonstrates Functionality	Prototype works fully and completely. Group clearly demonstrates improvement in this iteration.	Prototype work. Some improvement.	Prototype work sufficiently for user's needs, some lack of functionality. Little improvement in prototype function.	Major part of prototype incorrect or incomplete.	No attempt
Product Testing	User fully understood the usage of prototype and meets their need.	User clearly understood the usage of prototype and meets their need.	User partially understood the usage of prototype and partially meets their need.	User understood the usage of prototype but does not meet their need.	No attempt
Feedback and Iteration	Student engaged in a reflective and iterative design process. Student sought out opportunities to evaluate effectiveness.	Students made appropriate revisions to ideas or designs in response to feedback opportunities that were required / scheduled.	Some revision was attempted in response to feedback.	No revision was attempted in response to feedback.	No attempt
Reflective thinking	The reflection explains the student's own thinking and learning processes, as well as implications for future learning. The reflection articulates multiple connections between this learning experience and content from other courses, past learning, life experiences and/or future goals.	The reflection explains the student's thinking about his/her own learning processes. The reflection articulates connections between this learning experience and content from other courses, past learning experiences, and/or future goals.	The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process. The reflection attempts to articulate connections between this learning experience and content from other courses, past learning experiences, or personal goals, but the connection is vague and/or unclear.	The reflection does not address the student's thinking and/or learning. The reflection does not articulate any connection to other learning or experiences.	No attempt

6. INFORMAL PRESENTATION RUBRIC

The table below are the rubrics for Informal Presentation assessment at four (4) stages of DT:

COMMUNICATION SKILLS RUBRIC FOR DEFINE MINI GALLERY WALK				
DIMENSION	**EXCELLENT**	**GOOD**	**FAIR**	**MARKS**
	3	**2**	**1**	
DEFINE	Able to unpack collected data **efficiently**	Able to unpack collected data **satisfactorily**	Able to unpack collected data **moderately**	**/3**
	Describe persona **clearly**	Able to describe persona **adequately**	Able to describe persona **moderately**	**/3**
	Able to clarify P.O.V **excellently** to the team members and facilitators	Able to clarify P.O.V **satisfactorily** to the team members and facilitators	Able to clarify P.O.V **moderately** to the team members and facilitators	**/3**
			TOTAL	**/9**

COMMUNICATION SKILLS RUBRIC FOR CO-CREATION WITH NON-TARGET USERS				
DIMENSION	**EXCELLENT**	**GOOD**	**FAIR**	**MARKS**
	3	**2**	**1**	
CO-CREATION WITH NON TARGET USERS Respond and justify	Able to respond to **all** the queries and suggestion received	Able to respond to **several** of the queries and suggestion received	Able to respond to a **few** of the queries and suggestion received	**/3**
	Able to justify to **all** the queries and suggestion received	Able to justify to **several** of the queries and suggestion received	Able to justify a **few** of the queries and suggestion received	**/3**
Utilizing feedback	Able to utilize **a lot** meaningful of feedbacks	Able to utilize **several** meaningful feedbacks	Able to utilize a **few** meaningful feedbacks	**/3**
			TOTAL	**/9**

COMMUNICATION SKILLS RUBRIC FOR CO-CREATION WITH TARGET USERS				
DIMENSION	**EXCELLENT**	**GOOD**	**FAIR**	**MARKS**
	3	**2**	**1**	
CO-CREATION WITH TARGET USERS Respond and justify Utilizing feedback	Able to respond to **all** the queries and suggestion received	Able to respond to **several** of the queries and suggestion received	Able to respond to a **few** of the queries and suggestion received	**/3**
	Able to justify to **all** the queries and suggestion received	Able to justify to **several** of the queries and suggestion received	Able to justify a **few** of the queries and suggestion received	**/3**
	Able to utilize **a lot** meaningful of feedbacks	Able to utilize **several** meaningful feedbacks	Able to utilize a **few** meaningful feedbacks	**/3**
	Able to engage appropriately with target user	Able to engage satisfactorily with target user	Able to engage but hesitantly with target user	**/3**
			TOTAL	**/12**

COMMUNICATION SKILLS RUBRIC FOR GALLERY WALK					
NO.	**ASSESSMENT CRITERIA**	**EXCELLENT (3)**	**GOOD (2)**	**POOR (1)**	**MARKS**
1.	**Description and explanation about the prototype (type of product/service/ system, function of prototype) for the project.**	Main points are **very clear** and very detailed. Information is directly link to the project.	Main points are **somewhat clear** but could use more detail. More information is link to the project.	Lack of main points. Lacks connection to the project.	/3
2.	**What are the problems faced by the target user?**	Main points are **very clear** and very detailed. Information is directly link to the project.	Main points are **somewhat clear** but could use more detail. More information is link to the project.	Lack of main points. Lacks connection to the project.	/3
3.	**Explain how you came up with this solution**	Main points are **very clear** and very detailed. Information is directly link to the project.	Main points are **somewhat clear** but could use more detail. More information is link to the project.	Lack of main points. Lacks connection to the project.	/3
4.	**What were the feedbacks received from the end user about your prototype?**	Main points are **very clear** and very detailed. Information is directly link to the project	Main points are **somewhat clear** but could use more detail. More information is link to the project.	Lack of main points. Lacks connection to the project.	/3
5.	**From the input received, what improvement has been done to your prototype?**	Main points are **very clear** and very detailed. Information is directly link to the project	Main points are **somewhat clear** but could use more detail. More information is link to the project.	Lack of main points. Lacks connection to the project.	/3
				TOTAL	**/15**