

The Hong Kong University of Science and Technology

Course Syllabus:

ENGG 1300 – Design Thinking for Health Innovation (Fall 2026/27)

Course Details

- **Course Title:** Design Thinking for Health Innovation
- **Course Code:** ENGG 1300
- **No. of Credits:** 3 Credits
- **Pre-requisites / Co-requisites:** None
- **Class Schedule:** Tuesdays, 01:30 PM – 04:20 PM
- **Term:** Fall 2026/27 (01 Sep 2026 – 24 Nov 2026)
- **Instructor:** Dr. H. I. Malinda M. Abeynayake
- **Email:** malinda@ust.hk
- **Office Hours:** By email appointment

Course Description

A project-based, experiential course that exposes students to the Design Thinking process for health innovation to address real-world unmet needs in society. The goal of this course is to develop students' communication, interpersonal, teamwork, analytical, design, and project management skills through a multi-disciplinary, team-based design experience. The Design Thinking process modules: empathise, define, ideate, prototype and test, will be introduced and the students will learn experientially by applying these process modules to solve the unmet health needs they observe in real life. The students are required to report their progress throughout the semester. Throughout the course, they will showcase their prototype in the project pitch and submit their project report. It is a common core course for students from different schools who have no background in Design Thinking or are looking for practical experience in Design Thinking.

This year the course will focus on "How to tackle stress and innovate interventions to design HKUST Life."

Course Intended Learning Outcomes (CILOs)

By the end of this course, students will be able to:

- **CILO 1:** State and explain the process modules of Design Thinking.
- **CILO 2:** Apply Design Thinking to solving real-world health issues in society.
- **CILO 3:** Work and communicate effectively in a multi-disciplinary team.
- **CILO 4:** Generate innovative ideas, assess and perform iterative prototyping cycles to decide the best solution, and implement ideas into innovations.
- **CILO 5:** Learn professional and technical knowledge on design and innovation processes.

Assessment and Grading

This course will be assessed using **criterion-referencing** and grades will not be assigned using a curve. Detailed rubrics for each assignment outline the criteria used for evaluation. All presentation slides must be uploaded to Canvas at least 24 hours prior to each presentation.

Summary Assessment Table

Assessment Task	Contribution to Overall Grade (%)	Due Date / Timeline
1st Presentation: User/Market Research & Initial Ideas	15%	Week 4 (22 Sep 2026)
2nd Presentation: 1st Prototype	15%	Week 8 (20 Oct 2026)
3rd Presentation: 2nd Prototype / Final Project Pitch	20%	Week 13 (24 Nov 2026)
Project Report: Group Design Video	15%	Week 13 (24 Nov 2026)
Personal Reflection / Miro-board	15%	Week 4 - 13
Peer Evaluation (2x)	20%	Week 8 & Week 13

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped CILOs	Explanation
1st Presentation: User/Market Research & Initial Ideas (15%)	CILO 1, CILO 3, CILO 4	The primary purpose of this first presentation is for student teams to demonstrate a clear understanding of user needs, conduct comprehensive research on existing market solutions, identify key gaps, and propose creative initial concepts.
2nd Presentation: 1st Prototype (15%)	CILO 1, CILO 2, CILO 3, CILO 4, CILO 5	Assesses early prototype development, application of design thinking to real-world health issues, teamwork, and integration of user feedback into design iterations.
3rd Presentation: Final Project Pitch (20%)	CILO 1, CILO 2, CILO 3, CILO 4, CILO 5	Evaluates the matured solution, rationale and evolution of the prototype, implementation plan, poster presentation, and professional team pitch skills.
Project Report: Group Design Video (15%)	CILO 2, CILO 3, CILO 4	Assesses comprehensive video documentation of user needs, prototype iterations, technical considerations, and team division of tasks through video submission.
Personal Reflection / Miro-board (15%)	CILO 1, CILO 5	Evaluates individual learning journey, mastery of design thinking process tools on digital boards, and technical insights gained throughout the project.

Peer Evaluation (2x) (20%)	CILO 3	Measures active participation, team contribution, meeting attendance, communication, and interpersonal effectiveness within the group.
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Assessment Guidelines & Detailed Grading Rubrics

1. 1st Presentation: User/Market Research & Initial Ideas (15%)

Presentation Structure & Guidelines

- **Two Problem Statements:** Clearly define two distinct, user-centered problems.
- **Understand User Needs & Pain Points:** Investigate specific challenges using data, interviews, surveys, or case studies.
- **Research Existing Solutions:** Analyze current products, services, or technologies addressing these pain points.
- **Compare & Evaluate:** Highlight gaps and limitations in current market offerings.
- **Ideation Based on Insights:** Propose **three innovative ideas** for each problem statement (focus on originality and creative thinking).
- **Presentation Format:** Medium of choice (PowerPoint, Prezi, Word, etc.) supporting effective storytelling.
- Duration: TBC.

Grading Breakdown

Criteria Item	Weightage
Problem Statements & needs/pain points of the user	15%
Content (Mix of research papers, articles, user interviews, observations, and existing technologies/practices)	30%
Analysis of data (Gaps and limitations of current solutions or practices)	20%

Initial Ideas (Three creative ideas per problem statement)	15%
Class Participation & Peer Feedback	20%

2. 2nd Presentation: 1st Prototype (15%)

Grading Criteria Breakdown

Criteria Category	Weightage	Key Evaluation Points
Problem & User Insight	10%	User-centric problem definition rooted in specific user pain points; clear articulation of <i>"Whose problem is this?"</i> and <i>"Why is it important to solve?"</i> .
Creativity & Innovation	20%	Unique concept or novel application of existing tech; feasible innovation balancing creativity and realism with potential for implementation.
Prototype Development & Detail	35%	Tangible prototype (physical, digital, process map, etc.) communicating core functionality; directly addressing key pain points; clear and compelling demonstration.
User-Centered Design & Iteration	20%	Evidence of user testing (interviews, usability tests, quotes, screen captures); demonstration of design iteration based on user feedback loop.
In-Class Participation & Peer Feedback	15%	Active engagement, constructive feedback, and thoughtful Q&A contributions during peer presentations.

3. 3rd Presentation: Final Project Pitch (20%)

A. Content (60% of 3rd Presentation Grade)

- **Problem & User Insight:** Definition rooted in specific student needs and emotional pain points; primary research evidence (HKUST students) and supporting secondary data; clear justification for why this problem matters *NOW*.
- **Creativity & Innovation:** Differentiation from existing HKUST/market practices; clear value proposition tailored to HKUST context; balance between ambitious vision and practical 6-month feasibility.
- **Prototype Development & Impact:** Detailed prototype showcasing core functionality; connection to user journey pain points; 6-month implementation roadmap; quantitative/qualitative impact metrics; long-term sustainability plan.
- **User-Centered Design Process:** Evidence of multiple rounds of user testing with diverse student groups; iterative evolution from initial concepts; application of emotional design principles.

B. Poster Evaluation (30% of 3rd Presentation Grade)

- **Content & Organization:** Logical flow guiding viewers through the design journey; clear problem/solution overview, key research insights, and metrics visible at a glance.
- **Layout & Visual Design:** Professional A1 size (594mm x 841mm, landscape orientation) layout; clear visual hierarchy; high-quality graphics, user maps, typography, and cohesive color scheme.
- **Overall Impact & Communication:** Captures attention quickly; memorable visual storytelling; clear key takeaways for stakeholders.

C. Counter Space Utilization (10% of 3rd Presentation Grade)

- **Design & Experience:** Strategic arrangement of space, prototype, and process journey materials; professional and inviting aesthetic.
- **Functionality & Demonstration:** Smooth integration of poster, prototype, and interactive demo area; effective handling of visitor flow and stakeholder engagement.

4. Project Report: Group Design Video (15%)

Evaluation Criteria

- **Design & Experience:** Strategic organization of video content presenting the end-to-end design thinking journey; professional and engaging storytelling aesthetic.
- **Functionality & Demonstration:** Clear, functional demonstration of the final prototype; logical narrative flow explaining user research, prototype evolution, technical considerations, and real-world impact.

5. Personal Reflection / Miro-board (15%) & Peer Evaluation (2x) (20%)

- *Note: Detailed rubrics and submission guidelines for these two assessment components will be shared separately during the semester.*

Weekly Course Schedule (Fall 2026/27)

- **Class Time:** Tuesdays, 01:30 PM – 04:20 PM

Week	Date	Topic & Activities	Related CIOs
1	Sep 01, 2026	Introduction & Team Building • Ice-breaking activities • Introduction to course overview and Problem Statement • Team building activities and introduction to Design Thinking process	CIO 1, CIO 5
2	Sep 08, 2026	Understand User Needs • Understand user needs and problem space • Observe existing technologies and practices • User research & initial brainstorming • Team formation for 1st round	CIO 1, CIO 2, CIO 3, CIO 4

3	Sep 15, 2026	Ideation & Personal Miro-Board • Identify unmet user needs • Brainstorm creative solutions • Develop initial concept prototypes • Introduction to personal Miro-board setup	CILO 1, CILO 2, CILO 3, CILO 4, CILO 5
4	Sep 22, 2026	1st Presentation: User Research & Initial Ideas • Team presentation on user/market research and initial ideas • Presentation of identified problem statement and proposed ideas • Peer and teaching team feedback	CILO 1, CILO 3, CILO 4, CILO 5
5	Sep 29, 2026	Introduction to Design Thinking Workshop • In-depth Design Thinking workshop • Hands-on activities practicing design concepts • Team time: Refinement and ideation for Problem Statement	CILO 1, CILO 2, CILO 3, CILO 4
6	Oct 06, 2026	Reflection & Site Observation • Review of user feedback and observation data • Project progress review and coaching session	CILO 2, CILO 3, CILO 5
7	Oct 13, 2026	Prototyping Workshop I • Basic prototyping methods using cardboard, foam, and quick tools • Teams conduct initial low-fidelity prototyping for filtered ideas	CILO 2, CILO 3, CILO 4, CILO 5
8	Oct 20, 2026	2nd Presentation: 1st Prototype • 1st Prototype presentation and demonstration to the class • 2nd Round team formation • Re-defining the problem space based on user feedback • <i>First Peer Evaluation due</i>	CILO 1, CILO 2, CILO 3, CILO 4

9	Oct 27, 2026	Prototyping Workshop II & Team Time • Workshop on 3D modelling, and 3D Printing prototyping • Presentation of new Problem Statements • Dedicated team development time	CILO 2, CILO 3, CILO 4, CILO 5
10	Nov 03, 2026	Advanced Prototyping & Feedback Session • Hands-on prototyping using advanced digital tools and hand tools • Team prototype testing	CILO 2, CILO 3, CILO 4, CILO 5
11	Nov 10, 2026	Team Time & Final Testing • User testing and validation on prototypes • Peer feedback session for project refinement	CILO 2, CILO 3, CILO 4
12	Nov 17, 2026	Final Project Pitch Preparation & Feedback • Final prototype refinement • Teaching team feedback and consultation session	CILO 2, CILO 3, CILO 4
13	Nov 24, 2026	Final Project Pitch (3rd Presentation) & Course De-briefing • Final pitch including background, rationale, prototype demo, and implementation plan • Course de-briefing and lessons learned • <i>Submission of Group Design Video, Personal Reflection / Miro-board, and 2nd Peer Evaluation</i>	CILO 1, CILO 2, CILO 3, CILO 4, CILO 5

Final Grade Descriptors

Grade	Performance	Elaboration on Subject Grading Description
A	Excellent Performance	Demonstrates a thorough, sophisticated understanding of Design Thinking principles and health innovation processes. Exhibits exceptional creativity in problem formulation, rigorous iterative prototyping, outstanding multidisciplinary teamwork, and clear, compelling presentation and project report delivery.
B	Good Performance	Shows a solid understanding of the Design Thinking process and health innovation concepts. Effectively executes user research, ideation, and prototyping cycles. Demonstrates good collaboration skills within a multidisciplinary team and delivers well-organized presentations and project deliverables.
C	Satisfactory Performance	Possesses adequate knowledge of Design Thinking process modules. Successfully completes user research and basic prototype building, demonstrating satisfactory teamwork and meeting basic requirements for project pitches and reporting.
D	Marginal Pass	Demonstrates basic, threshold understanding of Design Thinking. Shows limited engagement in prototyping iterations or user testing. Exhibits minimal contribution to team activities, with marginal fulfillment of project requirements.
F	Fail	Fails to demonstrate a basic understanding of Design Thinking principles or health innovation processes. Unsuccessful in developing prototypes or submitting group deliverables. Displays insufficient teamwork and fails to meet minimum course requirements.

Course AI Policy

The use of Generative AI tools is permitted to assist students with brainstorming, initial concept drafting, and report writing, provided proper acknowledgment is given in submissions and presentations. AI tools must supplement, not replace, active human design thinking, user empathy research, and physical/digital prototype development.

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission. Feedback on assignments will include [specific details, e.g., strengths, areas for improvement]. Students who have further questions about the feedback, including marks should consult the instructor within five working days after the feedback is received.

Late Submission Policy

To ensure fairness for all students:

- Submissions made within 12 hours after the deadline will incur a **25% penalty**.
- Submissions made between 12 and 48 hours late will incur a **50% penalty**.
- Submissions late by more than 48 hours will **not be accepted**.

Required & Supplementary Learning Materials

Required Materials

- Open-source resources from Hasso Plattner Institute of Design at Stanford University:

[Stanford d.school Design Thinking Bootleg](#)

Recommended Supplementary Materials

- Stickdorn, M., Hormess, M. E., Lawrence, A., & Schneider, J. (2017). *This Is Service Design Doing: Applying Service Design Thinking in the Real World*. O'Reilly Media. ISBN: 978-1491927182.

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to [Academic Integrity | HKUST – Academic Registry](#) for the University's definition of plagiarism and ways to avoid cheating and plagiarism.