

**Lingnan University**  
**Course Syllabus**

|                                 |   |                                |
|---------------------------------|---|--------------------------------|
| <b>Course Title</b>             | : | Innovative Design Fundamentals |
| <b>Course Code</b>              | : | CDS1101                        |
| <b>Recommended Study Year</b>   | : | Year 1                         |
| <b>No. of Credits</b>           | : | 3                              |
| <b>Mode of Tuition</b>          | : | Sectional approach             |
| <b>Class Contact Hours</b>      | : | 3 hours per week               |
| <b>Category</b>                 | : | Major Required                 |
| <b>Discipline</b>               | : | Nil                            |
| <b>Prerequisite(s)</b>          | : | Nil                            |
| <b>Co-requisite(s)</b>          | : | Nil                            |
| <b>Exclusion(s)</b>             | : | Nil                            |
| <b>Exemption Requirement(s)</b> | : | Nil                            |

**Brief Course Description:**

Design Thinking is a human-centered iterative approach to innovation that empowers students to tackle complex, real-world challenges through creativity and collaboration. This course is structured around the five core modules of the Design Thinking process (i.e., Empathize, Define, Ideate, Prototype, and Test) and emphasizes experiential, project-based learning. Students will work in teams to apply design thinking principles to real-world problems, engaging in activities such as user research, need-finding, brainstorming, rapid prototyping, and user testing. Through group projects, students will explore topics like designing innovative products. The course fosters practical skill development in communication, teamwork, analytical thinking, and project management. By the end of the course, students will have gained hands-on experience in creating innovative solutions, preparing them to contribute effectively to diverse professional and academic contexts.

**Aims:**

This course aims to cultivate foundational design competencies and innovative mindsets for tackling complex, real-world challenges.

1. Introduce core principles of design thinking, innovation frameworks, and human-centred design processes.
2. Develop skills in problem identification, user research, ideation, prototyping, and testing.

3. Foster collaborative and reflective practice through studio-based learning and project work.
4. Encourage ethical and sustainable considerations in the design of products, services, and systems.
5. Prepare students to apply innovative design approaches in interdisciplinary contexts.

### **Learning Outcomes (LOs)**

Upon successful completion of this course, students will be able to:

1. Explain the key stages, tools, and mindsets of the design thinking process. (PILO3)
2. Apply user research methods to identify and articulate design opportunities. (PILO3)
3. Generate and refine creative ideas through structured ideation and prototyping techniques. (PILO5)
4. Collaborate effectively in multidisciplinary teams to develop and present design proposals. (PILO6)
5. Reflect critically on the ethical, social, and environmental implications of design decisions. (PILO7, PILO8)

### **Indicative Contents:**

#### Empathize – Understanding Users & Context

Covers the principles of human-centred design through user interviews, observation, empathy mapping, stakeholder analysis, and contextual inquiry.

#### Define – Framing the Problem

Focuses on synthesizing research insights to create personas and user journeys, and to define clear problem statements and design opportunities.

#### Ideate – Generating Creative Solutions

Explores brainstorming techniques such as SCAMPER, mind mapping, and analogy thinking, along with visual thinking, concept sketching, and idea selection frameworks.

#### Prototype – Making Ideas Tangible

Involves creating low-fidelity prototypes using paper, digital, and physical methods, and applying rapid prototyping tools and iterative design processes.

#### Test – Learning from Users

Teaches user testing methods, feedback capture, and iterative refinement of designs based on user insights, along with presenting design solutions.

### Design Ethics & Professional Practice

Examines ethical considerations in design—including inclusion, sustainability, and privacy—and develops storytelling, presentation, portfolio, and reflective practice skills.

### Teaching Methods:

The course adopts a sectional approach, combining theoretical input with hands-on, collaborative studio sessions. Lectures introduce key concepts, frameworks, and case studies. Studio sessions provide a supportive environment for students to apply tools, work in teams, and develop prototypes. Regular critiques, peer feedback, and reflective discussions are integral to the learning process.

### Measurement of Learning Outcomes:

| <div>Assessment</div> <div>LOs</div> | Class Attendance and Participation | Individual Design Assignments | Individual Design Project | Group Project and Presentation |
|--------------------------------------|------------------------------------|-------------------------------|---------------------------|--------------------------------|
|                                      | (10%)                              | (30%)                         | (30%)                     | (30%)                          |
| <b>LO1</b>                           | ✓                                  |                               |                           |                                |
| <b>LO2</b>                           |                                    | ✓                             | ✓                         | ✓                              |
| <b>LO3</b>                           |                                    | ✓                             | ✓                         | ✓                              |
| <b>LO4</b>                           | ✓                                  |                               |                           | ✓                              |
| <b>LO5</b>                           | ✓                                  |                               | ✓                         | ✓                              |

1. **Class Attendance and Participation (10%):** Students will be assessed on their consistent engagement and contribution throughout the course. This includes punctual attendance at all lectures and studio sessions, active involvement in class discussions, and meaningful participation in group activities and critiques. Students are expected to demonstrate preparedness, ask insightful questions, provide constructive peer feedback, and collaborate effectively in team settings, thereby explaining design thinking processes in context (LO1) and demonstrating collaborative teamwork skills (LO4). This component encourages ongoing reflection and dialogue, fostering a collaborative and responsive learning environment while promoting awareness of ethical and social implications in design practice (LO5).
2. **Individual Design Assignments (30%):** A series of three hands-on assignments will guide students through key stages of the design thinking process. *Exercise 1: Empathy*

& *User Research* requires students to conduct a mini user study and develop an empathy map and persona, applying user research methods to identify design opportunities (LO2). *Exercise 2: Ideation & Concept Sketching* focuses on generating a diverse range of ideas using structured brainstorming techniques, demonstrating the ability to generate and refine creative ideas (LO3). *Exercise 3: Low-Fidelity Prototype* involves building a testable prototype and conducting a simple usability test, applying prototyping techniques to iteratively develop solutions (LO3). These exercises build foundational skills in user-centred research, creative ideation, and iterative prototyping.

3. **Individual Design Project (30%):** Each student will undertake a sustained, end-to-end design project that applies the full design thinking process to a real-world challenge. Starting from problem discovery and user research, students will apply user research methods to define a design opportunity (LO2), develop and refine a prototype using iterative ideation and prototyping techniques (LO3), and produce a polished design portfolio documenting their process. The project concludes with a reflective report that critically examines their design decisions, iterative learnings, and evaluates the ethical and social implications of their proposed solution (LO5). This component assesses students' ability to independently manage a design process and articulate their thinking through both visual and written communication.
4. **Group Project and Presentation (30%):** Working in multidisciplinary teams, students will tackle a complex, socially relevant design challenge over the course of the semester. The group will collaborate to apply user research methods in a team context (LO2), ideate and prototype collectively demonstrating collaborative idea generation and refinement (LO3), and test a solution, culminating in a professional group presentation to peers and instructors. This project emphasizes effective teamwork and communication (LO4) and requires students to critically reflect on the ethical, social, and environmental dimensions of their design proposal (LO5). Deliverables include a comprehensive group report, a functional prototype, and a confidential peer evaluation to assess individual contributions.

#### **Assessment:**

|                                    |      |
|------------------------------------|------|
| Class Attendance and Participation | 10%  |
| Individual Design Assignments      | 30%  |
| Individual Design Project          | 30%  |
| Group Project and Presentation     | 30%  |
| Total                              | 100% |

### **Required/Essential Readings:**

1. Kwong, C. K., Jiang, H., & Luo, X. G. (2016). AI-based methodology of integrating affective design, engineering, and marketing for defining design specifications of new products. *Engineering Applications of Artificial Intelligence*, 47, 49-60.
2. Akhtar, M. H., & Ramkumar, J. (2023). *AI for Designers*. Springer Nature.
3. Dorst, K. (2011). The core of 'design thinking' and its application. *Design studies*, 32(6), 521-532.

### **Recommended/Supplementary Readings:**

1. Rowe, P. G. (1991). *Design thinking*. MIT press.
2. Stige, Å., Zamani, E. D., Mikalef, P., & Zhu, Y. (2024). Artificial intelligence (AI) for user experience (UX) design: a systematic literature review and future research agenda. *Information Technology & People*, 37(6), 2324-2352.
3. Saeidnia, H. R., & Ausloos, M. (2024). Integrating artificial intelligence into design thinking: A comprehensive examination of the principles and potentialities of AI for design thinking framework. *InfoScience Trends*, 1(2), 1-9.
4. Sadek, M., Calvo, R. A., & Mougnot, C. (2024). Designing value-sensitive AI: a critical review and recommendations for socio-technical design processes. *AI and Ethics*, 4(4), 949-967.
5. Dignum, V. (2019). *Responsible artificial intelligence: how to develop and use AI in a responsible way* (Vol. 2156). Cham: Springer.
6. Younjang, H., & Yi, W. (2024). A Study on Brand Design Methodology Using Generative AI. *International Journal Of Advanced Smart Convergence*, 50-59.

**Important Notes:**

- (1) Students are expected to spend a total of 9 hours (i.e. 3 hours of class contact and 6 hours of personal study) per week to achieve the course learning outcomes.
- (2) Students shall be aware of the University regulations about dishonest practice in course work, tests and examinations, and the possible consequences as stipulated in the Regulations Governing University Examinations and Course Work. In particular, plagiarism, being a kind of dishonest practice, is “the presentation of another person’s work without proper acknowledgement of the source, including exact phrases, or summarised ideas, or even footnotes/citations, whether protected by copyright or not, as the student’s own work”. Students are required to strictly follow university regulations governing academic integrity and honesty.
- (3) Students are required to submit writing assignment(s) using Turnitin.
- (4) To enhance students’ understanding of plagiarism, a mini-course “Online Tutorial on Plagiarism Awareness” is available on <http://pla.ln.edu.hk/>.
- (5) Students must adhere to the University’s guidelines and practices when using Generative Artificial Intelligence (GAI) tools. The official documents “Guidelines for Using GAI Tools at Lingnan University” and “Best Practices for Ethical and Responsible Use of GAI Tools in Course Assessments” can be found here: <https://www.ln.edu.hk/tlc/generative-artificial-intelligence/gai-guidelines-best-practices>.

**Lingnan University**  
**Course Rubrics**

**Rubric for Attendance and Participation (10%)**

| <b>Criterion</b>                               | <b>Excellent<br/>(80-100)</b>                                                                                                                                                                                                              | <b>Good<br/>(65-79)</b>                                                                                                                                                                                                                  | <b>Pass<br/>(50-64)</b>                                                                                                                                                                                                                    | <b>Fail<br/>(0-49)</b>                                                                                                                                                                                                              |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Punctual to attend class (30%)</b>          | Always come to the class on time                                                                                                                                                                                                           | Mostly come to the class on time                                                                                                                                                                                                         | Sometimes come to the class on time                                                                                                                                                                                                        | Seldom come to the class on time                                                                                                                                                                                                    |
| <b>Participation in class activities (70%)</b> | Proactively participate in class activities, including the completion of in-class exercises, engaging in group discussion, and asking relevant questions in the Q&A session of group presentation.<br><br>Demonstrate vigorous involvement | Participate as instructed in class activities including the completion of in-class exercises, engaging in group discuss, and asking relevant questions in the Q&A session of group presentation.<br><br>Demonstrates ongoing involvement | Sometimes participate as instructed in class activities including the completion of in-class exercises, engaging in group discuss, and asking relevant questions in the Q&A session of group presentation.<br><br>Demonstrates involvement | Seldom or never participate in class activities including the completion of in-class exercises, engaging in group discuss, and asking relevant questions in the Q&A session of group presentation.<br><br>Seldom or rarely involves |

1. Automated, quantitative record of sign-in time for each session: Digital attendance system (e.g., Moodle attendance tool, QR code scan). A late arrival is defined as arriving after the official session start time.
2. Structured observation using a standardized checklist aligned to rubric descriptors: Instructor/TA Checklist: A simple form for each session to log specific, observable student actions (see example below).

## Rubric for Individual Design Assignments (30%)

### Assignment 1: Empathy & User Research (10%)

| Criterion                                  | Excellent<br>(80-100)                                                                                             | Good<br>(65-79)                                                                          | Pass<br>(50-64)                                                                          | Fail<br>(0-49)                                                                       |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Depth of User Research (40%)</b>        | Research is thorough, multi-method (e.g., interview + observation), and captures nuanced user needs and contexts. | Research is adequate, uses at least one method, and identifies clear user insights.      | Research is basic, limited to one method, and yields superficial insights.               | Research is incomplete, poorly conducted, or lacks user focus.                       |
| <b>Synthesis &amp; Visualization (40%)</b> | Empathy map and persona are highly detailed, visually engaging, and clearly synthesized from research data.       | Empathy map and persona are clear, well-structured, and logically derived from research. | Empathy map and persona are present but lack detail, clarity, or connection to research. | Visualizations are missing, poorly constructed, or do not reflect research insights. |
| <b>Clarity &amp; Reflection (20%)</b>      | Report is well-written, reflective, and professionally presented; clearly articulates learnings and implications. | Report is clear and complete, with adequate reflection on the research process.          | Report is understandable but lacks depth in reflection or presentation.                  | Report is unclear, incomplete, or lacks reflective components.                       |

**Assignment 2: Ideation & Concept Sketching (10%)**

| <b>Criterion</b>                                           | <b>Excellent<br/>(80-100)</b>                                                                                        | <b>Good<br/>(65-79)</b>                                           | <b>Pass<br/>(50-64)</b>                                               | <b>Fail<br/>(0-49)</b>                                                  |
|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>Ideation<br/>Variety &amp;<br/>Creativity<br/>(40%)</b> | Generates 10+ diverse, original ideas; clearly applies two ideation techniques with creative fluency.                | Generates 8–10 relevant ideas; uses two techniques appropriately. | Generates 5–7 ideas; uses one technique adequately but lacks variety. | Ideas are few, repetitive, or not aligned with the problem scope.       |
| <b>Visual<br/>Communication<br/>(40%)</b>                  | Sketches are expressive, well-annotated, and effectively communicate concept intent and features.                    | Sketches are clear and labelled, with adequate visual detail.     | Sketches are basic but readable; annotations are minimal or unclear.  | Sketches are unclear, incomplete, or lack communicative value.          |
| <b>Rationale &amp;<br/>Selection (20%)</b>                 | Provides a compelling, well-reasoned rationale for idea selection; reflects critically on strengths and limitations. | Rationale is logical and clearly explained.                       | Rationale is brief or somewhat vague; limited critical reflection.    | Rationale is missing, unclear, or not connected to the ideas presented. |

**Assignment 3: Low-Fidelity Prototype (10%)**

| <b>Criterion</b>                                               | <b>Excellent<br/>(80-100)</b>                                  | <b>Good<br/>(65-79)</b>                                        | <b>Pass<br/>(50-64)</b>                                  | <b>Fail<br/>(0-49)</b>                                   |
|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| <b>Prototype<br/>Quality &amp;<br/>Functionality<br/>(40%)</b> | Prototype is creative, testable, well-constructed, and clearly | Prototype is functional and adequately represents the concept. | Prototype is basic or partially functional; some aspects | Prototype is incomplete, non-testable, or does not align |

|                                               |                                                                                                                       |                                                                                    |                                                                             |                                                                              |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------|
|                                               | represents the intended solution.                                                                                     |                                                                                    | are unclear or unfinished.                                                  | with the design intent.                                                      |
| <b>Usability Testing &amp; Feedback (40%)</b> | Conducts systematic testing with clear protocol; captures insightful user feedback and documents findings thoroughly. | Testing is conducted with clear steps; feedback is recorded adequately.            | Testing is minimal or informal; feedback is briefly noted but lacks depth.  | Little to no testing conducted; feedback is absent or poorly documented.     |
| <b>Reflection &amp; Iteration Plan (20%)</b>  | Reflection is insightful, clearly identifies learnings, and proposes specific, reasoned iterations for improvement.   | Reflection is present and identifies key learnings; suggests plausible next steps. | Reflection is basic; iteration suggestions are vague or not well justified. | Reflection is superficial, missing, or lacks connection to testing outcomes. |

### Rubric for Individual Design Project (30%)

| <b>Criterion</b>                                     | <b>Excellent<br/>(80-100)</b>                                                                                                                                                    | <b>Good<br/>(65-79)</b>                                                                                                   | <b>Pass<br/>(50-64)</b>                                                                               | <b>Fail<br/>(0-49)</b>                                                                      |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Problem Definition &amp; Research Depth (20%)</b> | Problem is clearly and insightfully framed, grounded in thorough user research and contextual analysis. Demonstrates a nuanced understanding of user needs and systemic factors. | Problem is well-defined and supported by adequate user research. Identifies key user needs and contextual considerations. | Problem statement is somewhat vague or broad; research is basic and yields limited insights.          | Problem is poorly defined; research is superficial, incomplete, or absent.                  |
| <b>Ideation &amp; Concept Development (20%)</b>      | Demonstrates a wide range of creative, well-documented ideas. Clearly shows iterative thinking and selection process with strong rationale.                                      | Generates multiple relevant ideas with clear documentation. Selection process is logical and explained adequately.        | Ideas are limited in variety or creativity; documentation is basic; rationale for selection is brief. | Ideas are few, repetitive, or poorly documented; selection rationale is unclear or missing. |
| <b>Prototype Quality &amp; Execution (25%)</b>       | Prototype is highly functional, well-crafted, and clearly communicates the design intent. Effectively                                                                            | Prototype is functional and represents the concept adequately. Minor issues may exist in execution or finish.             | Prototype is basic or partially functional; may lack polish or clarity in certain aspects.            | Prototype is incomplete, non-functional, or fails to represent the proposed solution.       |

|                                                |                                                                                                                                                                              |                                                                                                          |                                                                                                      |                                                                          |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
|                                                | integrates key features and is ready for user testing.                                                                                                                       |                                                                                                          |                                                                                                      |                                                                          |
| <b>Testing, Iteration &amp; Learning (20%)</b> | Conducts thorough usability testing with clear protocols; captures insightful feedback and demonstrates meaningful iteration based on findings.                              | Testing is conducted appropriately; feedback is documented and used to inform some design refinements.   | Testing is minimal; feedback is noted but iteration is limited or not clearly connected to findings. | Little to no testing conducted; iteration is absent or poorly justified. |
| <b>Documentation &amp; Presentation (15%)</b>  | Portfolio and report are exceptionally well-structured, visually polished, and professionally presented. Clearly articulates the design journey, decisions, and reflections. | Documentation is clear, complete, and well-organized. Effectively communicates the process and outcomes. | Documentation is basic but complete; may lack visual polish or narrative clarity.                    | Documentation is disorganized, incomplete, or difficult to follow.       |

### Rubric for Group Project and Presentation (30%)

| <b>Criterion</b>                                              | <b>Excellent<br/>(80-100)</b>                                                                                                                                                      | <b>Good<br/>(65-79)</b>                                                                                            | <b>Pass<br/>(50-64)</b>                                                                                   | <b>Fail<br/>(0-49)</b>                                                                    |
|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Problem Understanding &amp; Research (20%)</b>             | Demonstrates deep, nuanced understanding of the problem context through comprehensive and multi-method research. Clearly identifies stakeholder needs and systemic factors.        | Shows good understanding of the problem with adequate research. Identifies key user needs and contextual elements. | Problem understanding is basic; research is limited or relies on superficial insights.                    | Problem analysis is weak; research is minimal, poorly conducted, or irrelevant.           |
| <b>Collaborative Ideation &amp; Concept Development (20%)</b> | Team demonstrates highly effective collaboration in generating diverse, creative ideas. Process is well-documented and shows clear convergence toward a strong, justified concept. | Team works well together; ideas are relevant and varied. Concept selection is logical and explained.               | Collaboration is functional but ideas may lack depth or variety. Concept development is somewhat unclear. | Team ideation is disjointed, limited, or poorly documented; concept is weak or unfocused. |
| <b>Prototype Development &amp; Technical Execution (25%)</b>  | Prototype is highly functional, polished, and clearly                                                                                                                              | Prototype is functional and represents the concept well. May have                                                  | Prototype is basic or partially functional; may                                                           | Prototype is incomplete, non-functional, or does not                                      |

|                                                     |                                                                                                                                                                                   |                                                                                                              |                                                                              |                                                                                          |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                                                     | demonstrates the proposed solution. Integrates multiple elements effectively and shows technical proficiency.                                                                     | minor execution issues but overall coherent.                                                                 | lack integration or polish.                                                  | align with the design intent.                                                            |
| <b>Presentation &amp; Communication (20%)</b>       | Presentation is engaging, professional, and clearly structured. Visual aids enhance the narrative. Team communicates persuasively and responds confidently to questions.          | Presentation is clear and well-organized. Communicates key points effectively, with adequate visual support. | Presentation is understandable but may lack polish, clarity, or engagement.  | Presentation is disorganized, unclear, or fails to communicate the project effectively.  |
| <b>Teamwork &amp; Individual Contribution (15%)</b> | All members contribute meaningfully and consistently. Team demonstrates strong coordination, mutual support, and effective conflict resolution. Peer feedback is highly positive. | Most members contribute adequately; teamwork is functional with clear roles and responsibilities.            | Contributions are uneven; some members may be less engaged or collaborative. | Teamwork is poor; significant issues with participation, coordination, or peer dynamics. |