

ISDN 4000S – Applied Generative AI for Interdisciplinary Projects

School:	School of Engineering
Subject Area:	Integrative Systems and Design
Course Credit:	3
Instructor:	LEUNG Jac Ka Lok
Pre-requisite/co-requisite:	Nil

Notes:

- The syllabi provided here is for reference only and may be subject to changes and adjustments as determined by the course instructors.

ISDN 4000S – Applied Generative AI for Interdisciplinary Projects Spring 2024 (3 Credits)

L1 **Time: Friday 09:00am – 10:50am,** **Venue: Rm 5564**
LA1 **Time: Wednesday 03:30pm – 05:20pm,** **Venue: Rm 5508**

Course Description

As industries demand a new generation of professionals who can collaborate across disciplinary lines, challenges arise in search of latest innovations which can facilitate interdisciplinary learning, collaboration, and effective project management in cross-discipline teams. This course will introduce the utilities of generative AI tools (e.g., ChatGPT) in both learning and project management. Students will work in team projects and tackle real design challenges presented by experts in fields such as EduTech, ArtTech, SportsTech, MarineTech, PropertyTech. This special topic aims to let students experiment on leveraging Generative AI to enhance work processes in design thinking and project management. Topics covered will include AI-enhanced design thinking, knowledge sharing principles, agile project management, collaborative learning, and AI in education.

Course Objectives

The course aims to empower students to take an active role in their own learning. Through the design and implementation of solutions for an interdisciplinary, technology-integrated project, students will contribute to addressing real-world challenges and engage in a self-reflective journey. Design thinking and project management are core skills to come up with quality user-centered solutions. This course adopts a project-based approach. Students will work on hands-on prototyping and pitch their solutions in an authentic and professional manner. Although the course project will place students in a specific field of interest (e.g., EduTech), the skills that students acquire will be transferrable to other interdisciplinary context. They will critically evaluate their own interdisciplinary studies, identify areas for growth, and develop a deeper understanding of their strengths and limitations.

Intended Learning Outcomes (ILO)

ILO No.	Description
1	Demonstrate an understanding of the principles and challenges of interdisciplinary projects
2	Identify appropriate Gen-AI tools for specific project requirements in interdisciplinary contexts
3	Utilize Gen-AI techniques to create personas, generate ideas and prototype solutions
4	Apply Gen-AI tools to enhance project planning, scheduling, resource allocation, and risk assessment
5	Reflect on personal growth and interdisciplinary learning journey
6	Collaborate effectively in interdisciplinary teams

Course Instructor(s)

Dr. Jac LEUNG
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Office: 3469 2793

Course Coordinators

TBA

Grading

Task Items	Type of Submission	% of final grade	ILO#
Active participation in-class activities, reading reflections and discussions	Individual	20%	1-6
Design thinking process documentation	Team	20%	1-6
Project management using Gen-AI	Team	10%	1-6
Project presentation	Team	30%	1-6
Learning portfolio	Individual	10%	1, 5
Peer evaluation	Individual	10%	6

Assignment Submissions

Students are required to individually submit all course assignments onto Canvas to the designated assignment folders. Assignments that are meant to be completed independently will be graded individually while team assignments will receive a team grade. However, students will not receive a grade for any assignment they do not submit.

Late Submissions

20% of the total marks will be deducted from an assignment for each day that it is late (weekends are also counted). Assignments submitted more than 5 days after the due date will receive a zero grade.

Attendance

Students need to contact Course Instructors or Course Coordinators in advance to make alternative arrangements if they cannot complete/attend any assessments.

Team Assessments

Individuals who have not received permission to be excused and are not present will receive a zero grade (except in cases of emergencies and documented illnesses). The whole team will lose out on any grades associated with a missing students' participation or contributions.

Weekly schedule

Wk	L/LA	Date	Day	Time	Activity	Remark
1	LA1	31 Jan	Wed	No class		
1	L1	2 Feb	Fri	0900 – 1050	Course Introduction (How AI is changing the future of work)	Common project issues
2	LA1	7 Feb	Wed	1530 – 1720	Case Study (J&J): Conventional vs. AI-empowered workflow	*GenAI application: HKUST ChatGPT / Poe Reflect on Project management issues
2	L1	9 Feb	Fri	0900 – 1050	AI in Education & AI literacy	*GenAI application: Notion AI (Reflective blog post) AI literacy questionnaire
3	LA1	14 Feb	Wed	1530 – 1720	Presenting Ideas	*GenAI application: Microsoft Copilot, Gamma.app (PPT generation) Topics: <ul style="list-style-type: none"> • Generative Adversarial Networks (GAN) • Supervised, unsupervised, reinforcement learning (RL) • Natural Learning Processing (NLP)
3	L1	16 Feb	Fri	0900 – 1050	AI-enhanced design thinking (Design Thinking Process walkthrough, AI adoption)	
4	LA1	21 Feb	Wed	1530 – 1720	Peer Teaching on GenAI tools	
4	L1	23 Feb	Fri	0900 – 1050	Talk by Industrial Partner <ul style="list-style-type: none"> • Application of AI in EdTech • Project Mgt retrospectives 	Reading on AI in Design Thinking + Presentation Invited Speaker: Eric (CEO of Lango)
5	LA1	28 Feb	Wed	1530 – 1720	Generating personas	*GenAI application: UXPressia (Multi-persona journey map)
5	L1	1 Mar	Fri	0900 – 1050	AI-enhanced design thinking (MISO)	Prompting tips
6	LA1	6 Mar	Wed	1530 – 1720	Initializing user research	*GenAI application: Miro / Figjam (Collaborative user research)
6	L1	8 Mar	Fri	0900 – 1050	AI-enhanced design thinking (Divergent Thinking)	
7	LA1	13 Mar	Wed	1530 – 1720	Ideating solutions	*GenAI application: Miro / Figjam (Collaborative brainstorming)
7	L1	15 Mar	Fri	0900 – 1050	Individual Group Consultation	
8	LA1	20 Mar	Wed	1530 – 1720	Problem Identification Presentation	
8	L1	22 Mar	Fri	0900 – 1050	Agile Project Management	Reading on AI in Project Management + Presentation
9	LA1	27 Mar	Wed	1530 – 1720	Initializing project planning workspace	*GenAI application: Notion AI (Project planning)
9	L1	29 Mar	Fri	Mid-term / Easter break		
9	LA1	3 Apr	Wed			
9	L1	5 Apr	Fri			
10	LA1	10 Apr	Wed	1530 – 1720	Project plan first look	

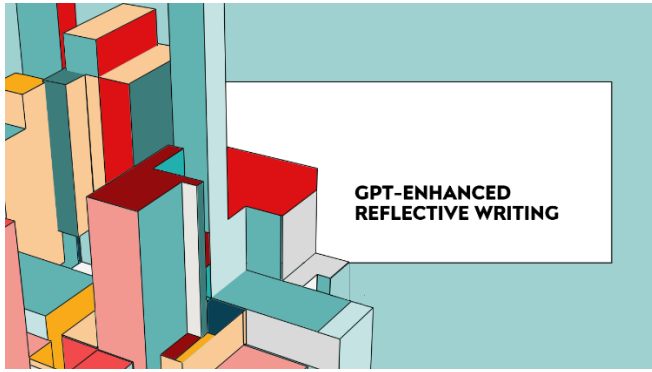
10	L1	12 Apr	Fri	0900 – 1050	AI-enhanced Project Management	*GenAI application: Notion AI (Kanban board, progress monitoring)
11	LA1	17 Apr	Wed	1530 – 1720	Project plan revised	
11	L1	19 Apr	Fri	0900 – 1050	Industry-standard proposal case study	*GenAI application: Notion AI (Proposal generation)
12	LA1	24 Apr	Wed	1530 – 1720	Individual group consultation	
12	L1	26 Apr	Fri	0900 – 1050	Final remarks + Individual group consultation	
13	LA1	1 May	Wed	Labor Day		
13	L1	3 May	Fri	0900 – 1050	Final Presentation (1)	
14	LA1	8 May	Wed	1530 – 1720	Final Presentation (2)	
14	L1	10 May	Fri	0900 – 1050	Learning Reflection	

25 Sessions in total

*GenAI applications:

- HKUST ChatGPT / Poe,
- Notion AI,
- Microsoft Co-pilot,
- Gamma.app,
- UXPressia,
- Miro / Figjam

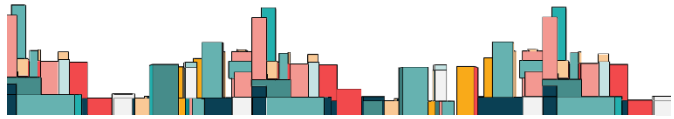
Sample course activities



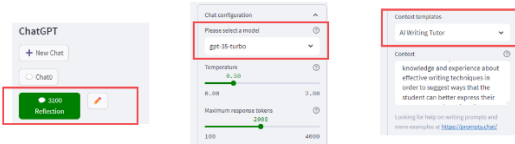
GPT-ENHANCED REFLECTIVE WRITING

On top of the reflection on Facebook:

1. Send a copy to ChatGPT with the following prompt: "How can I deepen the learning of the following reflection?"
2. Discuss further on one particular question / quote / reference raised by ChatGPT
3. Submit your dialogue with ChatGPT to Canvas



SETUP



EXAMPLE



YOU: how can I deepen the learning of the following reflection?

"Out of numerous points Dr. Jac Leung has made during his speaker session, what struck my mind the hardest was when he instantly replied that his responsibility to his family is what drives him. One reason is because it is what my father always says when he is asked about his motivations. Just like how most fathers including my father and Dr. Leung deem their family as their 'lives' motivation, I also believe responsibility can lead to motivation. How Dr. Leung's statement about responsibility driving him was inspiring because he knows exactly what he lives for. For my case, occasionally responsibility drives me to

AI: It's great that you found Dr. Jac Leung's statement about responsibility driving him to be inspiring. It's important to have a clear sense of motivation in order to be successful in any endeavor. To deepen your learning, you may want to consider the following questions:

- Have you ever experienced a situation where your sense of responsibility motivated you to take action or work harder? Can you describe that situation and how it made you feel?
- How can you apply Dr. Leung's example of using responsibility as a motivation to your own life and career goals? Are there specific areas where you can take on more responsibility in order to feel more motivated and driven?
- What are some other sources of motivation that you have explored or could explore in the future? Are there any personal values or passions that you could tap into in order to find a deeper sense of purpose?
- How can you communicate your sense of motivation to others, such as potential employers or collaborators? What language or examples can you use to convey your drive and commitment?

Questions

References

Additionally, you may want to explore further resources on the topic of motivation and entrepreneurship, such as books, articles, or podcasts. Some recommended readings include "Drive" by Daniel H. Pink, "The Lean Startup" by Eric Ries, and "The 7 Habits of Highly Effective People" by Stephen Covey.



AI-ASSISTED EMPATHY PROCESS

5 STAGES



EXAMPLE

My target audience is to help individuals with ADHD kids to learn better.



Persona	Max	Lily	Owen	Ava
Age	10	8	12	9
ADHD Diagnosis	Positive	Mild	Positive	Positive
Main struggle	Sitting still	Easily distracted	Time management and organization	Following directions
Coping mechanism	Fidget toys	task timers	Color-coding checklists	verbal reminders
Learning style	Kinesthetic	Visual	Auditory	Auditory
Hobby/Interest	Football	Drawing	Reading	Listen to music

EXAMPLE

My target audience is to help individuals with ADHD to learn better.



I want to create 5 example personas for ADHD young students. The design thinking project aims to help them better focus when studying, please tabulate into several columns with objective and observable characteristics of the personas

AI-ASSISTED EMPATHY PROCESS

3. RESEARCH AND PREP-WORK

Use a mix of **ChatGPT & traditional search**

- Media: Recent incident/development (2-page summary)
- Pick **2 out of 3 ISO strategies** and generate:
 - Interview: Interview protocol (adaptive)
 - Survey: Open/Closed-ended survey
 - Observation: Observation notes template

AI-ASSISTED EMPATHY PROCESS

4. TALK TO USERS

Use the generated results from Stage 3

	Instrument	# of results
Interview:	1 interviewer + 1 observer	5 interviewees
Survey:	approx. 10 questions	>30 participants (target user + relevant stakeholders)
Observation:	Key observation indicators	1 observation

Document the process



Recommended Reading / Further Reading

AI and Design Thinking

Readings

<https://vincenthunt.medium.com/design-thinking-and-ai-enhancing-user-centered-design-with-chatgpt-ddd6214f03e6>
<https://www.linkedin.com/pulse/powering-innovation-new-era-ai-infused-design-thinking-winston/>
<https://builtin.com/design-ux/ai-design-thinking>
<https://www.linkedin.com/pulse/impact-artificial-intelligence-design-thinking-arya/>
<https://ts2.space/en/how-ai-is-empowering-design-thinking-to-reach-new-heights/>
<https://ts2.space/en/the-rise-of-ai-enhanced-design-thinking-what-it-means-for-the-future-of-design/>

Toolkits

<https://dschool.stanford.edu/resources/i-love-algorithms>
<https://aixdesign.co/shop/p/cards-digital>

AI and Project Management

Readings

<https://hbr.org/2023/02/how-ai-will-transform-project-management>
<https://www.spiceworks.com/collaboration/project-collaboration/guest-article/how-ai-transforms-project-management/>
<https://catware.io/blog/ai-powered-project-management-an-ultimate-guide/>
<https://startups.co.uk/project-management-software/ai-in-project-management/>
<https://moonello.com/blog/top-6-ai-powered-project-management-tools-2023/>
<https://www.aidisruptor.ai/how-to-leverage-ai-tools-for-efficient-project-management/>

Toolkits

<https://ayanza.com/blog/ai-project-management-tools> (similar: <https://clickup.com/blog/ai-project-management-tools/>)

AI in EduTech

Readings

<https://www.forbes.com/sites/theyec/2023/02/21/ai-in-the-classroom-pros-cons-and-the-role-of-edtech-companies/?sh=a100f3afeb46>
<https://www.financialexpress.com/business/blockchain-the-impact-of-artificial-intelligence-in-the-edtech-industry-3161299/>
<https://www.edtechdigest.com/2023/05/26/the-impact-of-ai-in-edtech/>
<https://www.linkedin.com/pulse/how-artificial-intelligence-disrupting-edtech-shahjahan-chaudhary/>
<https://joshbersin.com/2023/04/edtech-is-going-crazy-for-ai/>

Micro learning - Learning in the Flow of Work: The Time is Now | Josh Bersin | Talent Connect 2018

<https://www.youtube.com/watch?v=ZpjbIeXEWg>

Related online courses

Coursera: AI and Design Thinking for Creativity. <https://www.coursera.org/specializations/creativity-ai>
HKUST CEI: <https://cei.hkust.edu.hk/en-hk/education-innovation/generative-ai-education>