

GENERAL EDUCATION, KMITL

COURSE SYLLABUS

Course Code	96642015	Course Title	CREATIVE THINKING AND INNOVATION				
Total Credits	3	Semester / Year of Study	1 / 2025	Section	SECTIONS 601/101	Date- Time	13.00-16.00 / 16.30-19.30
Course Description (English)	Creative Thinking and Innovation is an interdisciplinary course exploring the theoretical frameworks and practical application of creativity and innovation. Students will examine these concepts through the lenses of psychology, sociology, and technology. Emphasis will be placed on ideation, design thinking, and prototyping, aiming to enhance problem-solving and strategic planning skills. The course also investigates the role of creativity and innovation in driving competitiveness, sustainability, and social change within diverse organizational settings.						
Course Coordinator	A. Pat Pattarapongmanee						
Course Instructors	A. Pat Pattarapongmanee						
Teaching Assistant (if any)	-						
Counselling Schedule	-			Teaching Language	☐ Thai ☒ English ☐ Others, please specify.....		
Website or Online Teaching Method (if any)	-						

Course Learning Outcome

1. Understand and apply the key concepts and processes of creative thinking and innovation, including ideation, design thinking, and prototyping, to generate original and effective solutions to complex problems.
2. Analyze and evaluate the role and impact of creative thinking and innovation in various organizational and social contexts, contributing to competitiveness, sustainability, and social change.
3. Demonstrate an ability to balance and integrate analytical and imaginative thinking in both personal and professional settings, fostering an interdisciplinary mindset that appreciates the interplay between these modes of thought.

General Education Learning Outcome: GE-LO	
GE-LO	Value
☒ GE-LO-1 Analytical and Critical Thinking	2
☒ GE-LO-2 Complex Problem Solving	1
☒ GE-LO-3 Creativity	8
☐ GE-LO-4 Interpersonal Skills	
☐ GE-LO-5 Integrity and Perseverance	
☒ GE-LO-6 Active Learning and Learning Strategies	4
☐ GE-LO-7 Resilience, Stress Tolerance and Flexibility	
☐ GE-LO-8 Leadership and Social Influence	
☐ GE-LO-9 Communication	
☐ GE-LO-10 Entrepreneurship and Startup	
☐ GE-LO-11 Digital Quotient Literacy and Digital Media Production	
Total Value	<u>15</u>
Career Readiness Modules	
☒ Employee ☒ Self-employed ☒ Business Owner ☒ Investor ☐ None	

Teaching Plan and Evaluation Plan

Week	Topic/Sub-topic	Activities	Notes
1	Introduction to Creative Thinking	Virtual Lecture, Problem-Identification Activity	Students identify real-world problems they're interested in solving throughout the course
2	Introduction to Empathy Frameworks	Virtual Lecture, 5 Whys Activity, User Persona Creation	Students learn about empathy-driven problem-solving frameworks and apply them to understand their chosen problem
3	Creative Structures	In-person activity: Straw Structure Challenge	Students use straws to build a structure that can hold two water bottles, emphasizing creative problem-solving
4	Sensory Navigation - Part 1	Hands-on activity: Blindfold Guidance Challenge - Test	Students design a route and communication system to guide a blindfolded partner, testing initial ideas
5	Sensory Navigation - Part 2	Hands-on activity: Blindfold Guidance Challenge - Refine	Students refine their communication system based on test feedback and implement changes

Week	Topic/Sub-topic	Activities	Notes
6	Innovation in Motion - Part 1	Hands-on activity: Create a Simple Machine - Design	Students design a machine that performs a simple task using basic materials
7	Innovation in Motion - Part 2	Hands-on activity: Create a Simple Machine - Build	Students build their designed machine and test its functionality
8	Innovation in Motion - Part 3	Hands-on activity: Create a Simple Machine - Refine	Students refine their machine based on testing feedback and make final adjustments
9	Midterm Review/Feedback Session	Simple Machine Presentations and Feedback	Students present the machines they've developed and receive feedback
10	Rethinking Objects - Part 1	Hands-on activity: Everyday Object Redesign - Ideate	Students brainstorm ways to redesign an everyday object to better suit a specific user's needs
11	Rethinking Objects - Part 2	Hands-on activity: Everyday Object Redesign - Create	Students create a prototype of their redesigned object
12	Creative Solutions for Social Change	Group activity: Social Innovation Challenge	Students devise creative solutions to a given social issue, promoting collaborative creativity
13	Final Preparations	Final project work session	Students finalize their projects and prepare for the final presentation
14	Final Project Presentations	Final presentation of projects, Peer review	Students present their final solutions to the class and a panel of guest judges, followed by a critique and reflection session
15	Course Reflection and Feedback	Reflection and Feedback Session	Students reflect on their learning journey, share their experiences, and provide feedback on the course

Evaluation Plan

Assessment Activities	Value	Score	Week of Evaluation	Notes
Problem-Identification and Empathy Frameworks	1	4	Week 2	Assessment of students' understanding of their chosen problem and their application of empathy frameworks
Straw Structure Challenge	1	4	Week 3	Assessment of creative problem-solving and practical application
Blindfold Guidance Challenge - Test	1	4	Week 4	Initial assessment of design and communication system
Blindfold Guidance Challenge - Refine and Final	1	4	Week 5	Assessment of students' ability to iterate and improve on initial ideas
Create a Simple Machine - Design	1	4	Week 6	Assessment of initial machine design
Create a Simple Machine - Build and Refine	2	8	Week 8	Assessment of machine build, functionality, and refinement process
Midterm Simple Machine Presentations	2	8	Week 9	Midterm evaluation of students' presentation skills and understanding of their creative process
Everyday Object Redesign - Ideate and Create	2	8	Week 11	Assessment of creativity in object redesign and execution in prototype creation

Social Innovation Challenge	1	4	Week 12	Assessment of students' ability to devise creative solutions for social issues
Final Project Presentation	3	12	Week 14	Final evaluation of students' projects, understanding of creative thinking principles, and presentation skills
Total	15	60		

Evaluation criteria

☐ Group-based								
☒ Standard-based								
Grade	A	B+	B	C+	C	D+	D	F
Score (60 points)	57-60	49-56.9	41-48.9	34-40.9	27-33.9	21-26.9	15-20.9	0-14.9
☐ Satisfactory/Unsatisfactory (S/U)								
Grade	S				U			
Score (60 points)	30-60				0-29.9			

Scoring criteria according to Assessment Plan

Assessment Activities	Learning Outcomes	Value	Level			
			4 (Excellent)	3 (Good)	2 (Fair)	1 (Poor)
Problem-Identification and Empathy Frameworks	GE-LO-1	1	Comprehensive demonstration of understanding and implementation of empathy frameworks; excellent identification and demonstration of understanding of problem	Comprehensive demonstration of understanding and implementation of empathy frameworks; excellent identification and demonstration of understanding of problem	Comprehensive demonstration of understanding and implementation of empathy frameworks; excellent identification and demonstration of understanding of problem	Comprehensive demonstration of understanding and implementation of empathy frameworks; excellent identification and demonstration of understanding of problem
Straw Structure Challenge	GE-LO-2	1	Identification and resolution of challenges; original and stable structure; excellent active learning	Identification and resolution of challenges; somewhat original and stable structure; excellent active learning	Identification and resolution of challenges; minimally original and stable structure; excellent active learning	Identification and resolution of challenges; not original and stable structure; excellent active learning
Blindfold Guidance Challenge - Test	GE-LO-6	1	Design and communication system; consistently coordinated guidance of blindfolded partner; demonstrated learning strategies	Design and communication system; consistently coordinated guidance of blindfolded partner; demonstrated learning strategies	Design and communication system; consistently coordinated guidance of blindfolded partner; demonstrated learning strategies	Design and communication system; consistently coordinated guidance of blindfolded partner; demonstrated learning strategies
Blindfold Guidance Challenge - Refine and Final	GE-LO-6	1	Improvements to the design and communication system; consistently coordinated guidance of blindfolded partner;	Improvements to the design and communication system; consistently coordinated guidance of blindfolded partner;	Improvements to the design and communication system; consistently coordinated guidance of blindfolded	Improvements to the design and communication system; consistently coordinated guidance of blindfolded

Assessment Activities	Learning Outcomes	Value	Level			
			4 (Excellent)	3 (Good)	2 (Fair)	1 (Poor)
			demonstrated learning strategies	demonstrated learning strategies	partner; demonstrated learning strategies	partner; demonstrated learning strategies
Create a Simple Machine - Design	GE-LO-3	1	Machine design; adequate demonstration of understanding of task and original implementation	Machine design; adequate demonstration of understanding of task and somewhat original implementation	Machine design; adequate demonstration of understanding of task and minimally original implementation	Machine design; adequate demonstration of understanding of task and not original implementation
Create a Simple Machine - Build and Refine	GE-LO-3	2	Machine build, functionality, and iterative improvements	Machine build, functionality, and iterative improvements	Machine build, functionality, and iterative improvements	Machine build, functionality, and iterative improvements
Midterm Simple Machine Presentations	GE-LO-6	2	Use of visual aids and verbal clarity; thorough demonstration of understanding of original process; demonstrated learning strategies	Use of visual aids and verbal clarity; adequate demonstration of understanding of somewhat original process; demonstrated learning strategies	Use of visual aids and verbal clarity; partial demonstration of understanding of minimally original process; demonstrated learning strategies	Use of visual aids and verbal clarity; insufficient demonstration of understanding of not original process; demonstrated learning strategies
Everyday Object Redesign - Ideate and Create	GE-LO-3	2	Redesign ideas and prototype creation; adequate demonstration of understanding of user's needs	Redesign ideas and prototype creation; adequate demonstration of understanding of user's needs	Redesign ideas and prototype creation; adequate demonstration of understanding of user's needs	Redesign ideas and prototype creation; adequate demonstration of understanding of user's needs

Assessment Activities	Learning Outcomes	Value	Level			
			4 (Excellent)	3 (Good)	2 (Fair)	1 (Poor)
Social Innovation Challenge	GE-LO-1	1	Innot originalvative solution for social issues; thorough analytical and original thinking	Innot originalvative solution for social issues; adequate analytical and somewhat original thinking	Innot originalvative solution for social issues; partial analytical and minimally original thinking	Innot originalvative solution for social issues; insufficient analytical and not original thinking
Final Project Presentation	GE-LO-3	3	Use of visual aids and verbal clarity; thorough demonstration of understanding of original process; demonstrated learning strategies	Use of visual aids and verbal clarity; adequate demonstration of understanding of somewhat original process; demonstrated learning strategies	Use of visual aids and verbal clarity; partial demonstration of understanding of minimally original process; demonstrated learning strategies	Use of visual aids and verbal clarity; insufficient demonstration of understanding of not original process; demonstrated learning strategies