UTM
UNIVERSITI TEKNOLOGI MALAYSIA

COURSE INFORMATION

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School/Faculty:	**School of Postgraduate Studies**		
Program name:	**Doctor Professional Practice (D.Prof)**		
Course code:	**ELPD1123**	**Academic Session/Semester:**	**2024/25**
Course name:	**Project Ideation**	**Pre/co requisite (course name and code, if applicable):**	**None**
Credit hours:	**3**		

Course synopsis	Project Ideation is designed to solve the problems in the industry, particularly in the engineering field. It emphasizes the ability to identify industry-specific problems, effective communication, and ethical considerations. The course begins by equipping the student with the skills to recognize and analyse problems, so the students will delve into industry-specific challenges and opportunities through real-world scenarios. This course honed written and verbal communication skills, ensuring that ideas and solutions are clearly expressed to diverse stakeholders and helping the students to navigate complex ethical dilemmas while maintaining professional integrity. The students will also explore diverse ideation methodologies, such as design thinking and systems thinking, to approach complex engineering problems innovatively. Upon completion, the students will possess a valuable skill set, enabling them to identify industry-specific problems, communicate engineering solutions effectively, and address challenges with ethical considerations—a must for success in the engineering field.
Course coordinator (if applicable)	Dr Faizir Ramlie

	Name	**Office**	**Contact no.**	**E-mail**
Course lecturer(s)	Prof Dr Muhammad Zaly Shah bin Muhammad Hussei	FABU		b-zaly@utm.my
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Mapping of the Course Learning Outcomes (CLO) to the Programme Learning Outcomes (PLO), Teaching & Learning (T&L) methods and Assessment methods:

No.	CLO*	PLO **(MQF Cluster Code)	***Taxonomies and ****generic skills	T&L methods	*****Assessment methods
CLO1	Generate innovative engineering ideas and solutions by applying diverse ideation methodologies, such as design thinking and systems thinking.	PLO1 (C1)	C6	Active Learning	Assignment & ePortfolio
CLO2	Critically evaluate ideas to ensure the engineering ideas and solutions shall be developed and executed in an ethical and sustainable manner.	PLO11 (C5)	A3, EM2	Case Study	Presentation 1 & ePortfolio
CLO3	Respond effectively with stakeholder in ensuring that engineering solutions are well-understood and embraced.	PLO5 (C3C)	A3, CS3	Group or Class Activity	Presentation 2 & ePortfolio

****MQF Cluster Code**
C1 = Knowledge & Understanding, **C2** = Cognitive Skills, **C3A** = Practical Skills, **C3B** = Interpersonal Skills, **C3C**= Communication Skills, **C3D** = Digital Skills, **C3E** = Numeracy Skills, **C3F** = Leadership, Autonomy & Responsibility, **C4A** = Personal Skills, **C4B** = Enterpreneurial Skills, **C5** = Ethics & Professionalism

Details on Innovative T&L practices:

No.	Type	Implementation
1	Active Learning	Conducted through online class synchronously.
2	Case Study	Students reflect their professional working experience related to the course.

Transferable skills (generic skills learning in course of study which can be useful and utilised in other settings) :

Communication Skills, Ethics & Professionalism.

Student learning time (SLT) / Effective Learning Time (ELT) details:

Week/ Meeting	Course Content Outline and Subtopics	CLO*	Learning and Teaching Activities										TOTAL SLT
			Face-to-Face (F2F)								Non F2F Independent Learning		
			Physical				Online (Synchronous)				Online (Asynchronous)	Others	
			L	T	P	O	L	T	P	O			
Week 1	Module 1: Introduction to Ideation in Engineering 1-Understanding the significance of ideation in engineering design and problem-solving. 2-Exploring the role of creativity and innovation in the engineering field. 3-Overview of the overall engineering design system thinking and the ideation process.	CLO1					2				4		6
Week 2	Module 2: Identifying Engineering Challenges 1-Analyzing real-world engineering problems and challenges. 2-Defining problem statements for ideation sessions. 3- Identifying the importance of considering multiple perspectives and stakeholders.	CLO1					1			1	4		6
Week 3	Module 3: Ideation Techniques for Engineering 1- Brainstorming techniques adapted for engineering contexts. 2- Reverse engineering ideation: Starting with the desired outcome and working backward. 3- Concept sketching and visualization: Communicating ideas through drawings and diagrams. 4- Role of prototyping in the ideation process: Rapid prototyping and its benefits.	CLO1									4	2	6
Week 4	Module 4: Applying Systematic Creativity Tools 1- Using inventive principles to overcome technical contradictions. 2- Systematic exploration of potential solutions by combining parameters. 3-Merging existing ideas to create new solutions.	CLO1									4		4
Week 5	Module 5: Design Thinking for Engineering Ideation 1- Introduction to the stages of Design Thinking 2- Applying empathy and user-centered approaches to engineering ideation. 3- Prototyping and testing as iterative steps in the design process.	CLO1									4		4
Week 6	Module 6: Cross-Disciplinary Ideation 1- Promoting collaboration between engineers from different disciplines. 2- Techniques for integrating ideas from various fields to find innovative solutions. 3- Case studies of successful cross-disciplinary engineering projects.	CLO1									4		4

Week 7	Module 7: Idea Evaluation and Selection in Engineering 1- Establishing criteria for evaluating engineering ideas. 2- Feasibility assessment: Technical, economic, and environmental considerations. 3- Selecting ideas for further development and implementation.	CLO1					1			1	4		6
Week 8	MID-TERM BREAK												
Week 9	Module 8: Intellectual Property and Patent Considerations 1- Understanding intellectual property rights and patent issues in engineering ideation. 2- Strategies for protecting and managing intellectual property. 3- Ethical considerations in engineering innovation and intellectual property.	CLO2									4		4
Week 10	Module 9: Implementing and Communicating Engineering Ideas 1- Creating action plans for idea implementation. 2- Developing engineering proposals and project plans. 3- Effective communication of engineering ideas to stakeholders.	CLO3								2	4		6
Week 11	Module 10: Cultivating an Innovative Engineering Culture 1- Fostering a culture of continuous improvement and innovation within engineering teams. 2- Strategies for encouraging creativity and risk-taking in engineering projects. 3- Leveraging feedback and learning from failures.	CLO1									4	0	4
Week 12	Module 11: Emerging Technologies and Trends 1- Exploring cutting-edge technologies and trends in engineering. 2- Identifying opportunities for innovation in emerging fields. 3- Inspiring ideation through exposure to future-oriented concepts.	CLO1									4		4
Week 13	Module 12: Group Ideation Workshop 1- Collaborative ideation session on a predefined engineering challenge. 2- Facilitated brainstorming and idea development in small groups. 3- Sharing and presenting the generated ideas for constructive feedback.	CLO3					1			1	2		4
Week 14	Module 13: Design for Sustainability and Social Impact 1- Integrating sustainability principles in engineering ideation. 2- Understanding the concept of life cycle assessment (LCA) and its role in sustainable engineering.	CLO2									4		4
Week 15	3- Exploring social impact and considering ethical implications in engineering innovation. 4- Generating ideas that address environmental and social challenges while meeting engineering requirements.	CLO2					1			1	2		4
											SUB-TOTAL SLT :		66

	Continuous Assessment	%	Face-to-Face (F2F)		NF2F Independent Learning for Assessment		TOTAL SLT
			Physical	Online (Synchronous)	Online (Asynchronous)	Others	
1	Assignment	20			8	3	11
2	Presentation 1	10		1	3	2	6
3	Presentation 2	10		1	3	2	6
4	ePortfolio	60			16	15	31
		100					0
					SUB-TOTAL SLT :		54

	Summative Assessment	%	Face-to-Face (F2F)		NF2F Independent Learning for Assessment		TOTAL SLT
			Physical	Online (Synchronous)	Online (Asynchronous)	Others	
	-						
					SUB-TOTAL SLT :		0
					SLT for Assessment:		54
					GRAND TOTAL SLT:		120

A	% SLT for F2F Physical Component	0.00
B	% SLT for Online & Independent Learning Component :	100.00
C	%SLT for Online Component:	80.00
D	% SLT for All Practical Component:	0.00
D1	% SLT for F2F Physical Practical Component:	0.00
D2	% SLT for F2F Online Practical Component:	0.00
Please tick (/) if this course is Industrial Training/ Clinical Placement/ Practicum using 50% of Effective Learning Time (ELT)		

Identify special requirement or resources to deliver the course (e.g.,software,nursery, computer lab, simulation room etc)
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References (include required and further readings, and should be the most current)

1. Larry J. Leifer, Michael Lewrick, and Patrick Link (2020), The Design Thinking Toolbox: A Guide to Mastering the Most Popular and Valuable Innovation Methods, 1st Edition, John Wiley & Sons.

2. Christian Müller-Roterberg (2018), Handbook of Design Thinking, Kindle Direct Publishing

3. Pavel Livotov, Vladimir Petrov (2019), TRIZ: Innovation and Inventive Problem Solving. Handbook,

4. Walter Brenner, Falk Uebernickel (2016), Design Thinking for Innovation Research and Practice, Springer.

Other additional information (if applicable)
Academic honesty and plagiarism: *(Below is just a sample)*
Assignments are individual tasks and NOT group activities (UNLESS EXPLICITLY INDICATED AS GROUP ACTIVITIES) Copying of work (texts, simulation results etc.) from other students/groups or from other sources is not allowed. Brief quotations are allowed and then only if indicated as such. Existing texts should be reformulated with your own words used to explain what you have read. It is not acceptable to retype existing texts and just acknowledge the source as a reference. Be warned: students who submit copied work will obtain a mark of zero for the assignment and disciplinary steps may be taken by the Faculty. It is also unacceptable to do somebody else's work, to lend your work to them or to make your work available to them to copy.

Other additional information (if applicable)

Disclaimer:

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ELT = (Theory + Industrial Guidance + Assessment) x 50%

Total of credit for LI/Practical = ELT/40 Notional Hours

Note: For ODL Programme : Courses with mandatory practical requirement imposed by programme standards or any related standards can be exempted from complying to the minimum 80% ODL delivery rule in the SLT.

Prepared by:		**Certified by:**
Name:	Dr Faizir Ramlie	**Name:**
Signature:	*Faizir*	**Signature:**
Date:	23/11/2023	**Date:**