

## **COURSE OUTLINE**

**Course:** JEE649 Entrepreneurship and Innovation in Energy and Environment, 3 (3-0-6)  
Monday, 1.30-4.30 pm, at JGSEE & online

**Course coordinator:** Dr. Suneerat Fukuda

### **1. Course description**

Objective of the course is for students to familiarize themselves with various tools from idea creation to business development and can use them effectively when needed. Attending the course, the students will learn about business relating to energy and environment technology and management. The learning journey will start with the overview of energy and environment system in which the problems/gaps will be identified. Then, how to solve the problems with innovations and in some cases as far as new business creation. The student will also learn about the business model development and market validation in order to meet the customer demand and commercialize the idea or research results. Through lecture content, case studies of energy startups/incubators) and self-practice under guidance/coaching, at the end of the course, the students are expected to demonstrate their learning outcome through presentation of idea project for business development.

### **2. Target Knowledge, Skills, and Abilities (KSA)**

[Indicate what KSA this course will provide the students with.]

This course provides students with an ability to understand the situation and future trends in energy, environment and related sustainability issues. With the entrepreneurial skills they will be trained throughout the course, the students will be able to deliver creative and sustainable solutions to specific problems (idea projects) by applying entrepreneurial ways of thinking and critically reflecting on own expertise especially when working with colleagues with diverse skills and experiences.

### **3. Target group of students**

[Indicate if the course is opened for all students, including non-degree ones.]

The course is opened to students and workers at all academic levels and backgrounds.

### **4. Pre-requisites** [Indicate if the course requires some pre-requisites.]

None

### **5. Course Learning Outcomes** [Indicate the alignment of CLOs with the PLOs.]

CLO 1: Able to understand key concepts and tools in entrepreneurships and innovation in energy, environment and sustainability

CLO 2: Able to explain key concepts and tools in entrepreneurships and innovation in energy, environment and sustainability

CLO 3: Able to synthesize key concepts and tools in entrepreneurships and innovation in energy, environment and sustainability

CLO 4: Able to apply the acquired key concepts and tools in entrepreneurships and innovation in energy, environment and sustainability to successfully create an idea project to impact industry and society.

CLO 5: Able to communicate effectively in writing and orally to deliver the key information of the idea project.

## 6. Method of Teaching and Learning

[Specify if it would be 1/ Online; 2/ On-site; 3/ Hybrid; 4/ Online for lectures and On-site in small groups for discussions and workshops; 5/ Others.]

This course will be delivered on-site for lectures, group discussion, and individual/team project presentations. There will be some online lectures by invited speakers. Students will have opportunities to experience at some pitching events.

## 7. Course Outline and Organization

[Following KMUTT’s recommendations, a course should be organized based on the OBEM approach. A course can, therefore, be split over the semester, but also organized in consecutive weeks as before. A module can contain from 2 up to a maximum of 5 lectures depending on the target LOs. A 3 credits course can be composed of 3 to a maximum of 5 modules. In addition, indicate if the course is opened every Semester or a specific Semester.]

This course is opened once a year in Semester 2. For the Semester 2/2023, the course is scheduled every Monday afternoon (13.30 pm – 16.30 pm) from Monday 15 January to 13 May 2024.

Week	Date	Topic / Details	Learning outcome	Instructor
<b>Module 1: Introduction to entrepreneurships and innovation in energy, environment and sustainability</b> MLO 1: Able to understand key concepts of entrepreneurships and innovation in energy, environment and sustainability MLO 2: Able to explain key concepts of entrepreneurships and innovation in energy, environment and sustainability MLO 3: Able to synthesize key concepts of entrepreneurships and innovation in energy, environment and sustainability MLO 4: Able to apply the acquired key concepts of entrepreneurships and innovation in energy, environment and sustainability				
1	15 Jan	<b>Introduction of the course</b> <ul style="list-style-type: none"> <li>Ice breaking</li> <li>Introduction of the course, expected learning outcome</li> <li>Entrepreneur’s Journey &amp; Entrepreneurial mindset</li> <li>Project idea (product/ service) identification</li> </ul>	Students will be familiarized with the course and ready to go deeper with their idea project.	Dr. Suneerat Fukuda
2	22 Jan	<b>Overview and trends of energy, environment and sustainability</b> <ul style="list-style-type: none"> <li>Current energy industry and future trend</li> </ul>	Students have knowledge and idea about the energy system and environmental trend as well as others that influence business	Dr. Suneerat Fukuda

Week	Date	Topic / Details	Learning outcome	Instructor
		<ul style="list-style-type: none"> <li>Current environmental trend</li> <li>Carbon neutrality/Net zero emission paradigm</li> <li>Advanced technology and technology disruption</li> </ul>	creation and operation and why they are important.	
3	29 Jan	<b>Core technology, core value and solution</b>	Students will get a better understanding of these terms with various examples	Dr. Keita Ono
Evaluation: <ul style="list-style-type: none"> <li>Initial ideas submitted</li> </ul>				5 Feb
<b>MODULE 2: Creating ideas with impact</b> MLO 1: Able to understand key concepts and tools to create ideas with impact MLO 2: Able to explain key concepts and tools to create ideas with impact MLO 3: Able to synthesize key concepts and tools to create ideas with impact MLO 4: Able to apply the acquired key concepts and tools to create ideas with impact				
4	5 Feb	<b>Pain points identification and Ideation</b> <ul style="list-style-type: none"> <li>Design Thinking Process &amp; Methods</li> <li>Understanding Users</li> <li>Insights Analysis</li> <li>Project Brief</li> <li>Ideation &amp; Idea Screening Methods</li> </ul>	Students will be guided in a holistic approach of thinking process including initiated problem definition, research, analysis, user experience, and business viewpoint. Throughout the lecture, students will learn how to utilize appropriate research methods and service design methods to generate project brief and specification and apply for their project.	Dr. Chujit Treerattanaphan
5	12 Feb	<b>Business model canvas</b> <ul style="list-style-type: none"> <li>Business model canvas development to solve the identified problems</li> <li>Market validation of the business model e.g. with target group of customers</li> </ul>	Students will be able to develop the business model canvas to analyze their project	Mr. Radtasiri Wachirapunyanont
6	19 Feb	<b>Case studies of energy/environment related business/startup</b>	Students will learn and be inspired from the real energy/environment related business/startup	2 startups, each presenting 30-40 mins + 10-20 mins Q&A

Week	Date	Topic / Details	Learning outcome	Instructor
No class on 26 Feb – National holiday				
7	4 Mar	<b>Case studies of energy/ environment related business/startup</b>	Students will learn and be inspired from the real energy/environment related business/startup	2 startups, each presenting 30-40 mins + 10-20 mins Q&A
8-10	11 Mar 18 Mar 25 Mar	<b>Product development</b>	Students will be able to convert what they learn in the class and self-learning to develop their product * During product development, the consultation will be on appointment basis (both during and outside the class hours) to receive coaching/ comments to refine and improve their idea project	Dr. Suneerat Fukuda
Evaluation: Submitting a business model canvas of the project				1 Apr
<b>MODULE 3: Developing and presenting a project</b>				
MLO 1: Able to understand key concepts and tools to developing and presenting a project				
MLO 2: Able to explain key concepts and tools to developing and presenting a project				
MLO 3: Able to synthesize key concepts and tools to developing and presenting a project				
MLO 4: Able to apply the acquired key concepts and tools to developing and presenting a project				
11	1 Apr	<b>Story telling &amp; pitching skill</b> <ul style="list-style-type: none"> <li>• Good story telling</li> <li>• Essential skills needed for pitching</li> <li>• Do's &amp; Don'ts</li> </ul>	Students will learn and improve their presentation skills	Mr. Radtasiri Wachirapunyanont
No class on 8 Apr and 15 Apr – National holidays				
12-13	22 Apr 29 Apr	<b>Product development (cont.)</b>	Students will be able to finalize their idea project and prepare for pitching	Dr. Suneerat Fukuda
No class on 6 May – National holiday				
14	13 May	<b>Product development (cont.)</b>	Students will be able to finalize their idea project and prepare for pitching	Dr. Suneerat Fukuda
15	20 May	<b>Final pitching</b>	Students will present their project and get comments	Dr. Suneerat Fukuda & invited experts

Week	Date	Topic / Details	Learning outcome	Instructor
Evaluation:				
<ul style="list-style-type: none"> <li>• Presentation of the project and submission of pitch deck</li> </ul>				20 May

## 8. Evaluation Methods

[Indicate the methods used to evaluate the LOs, e.g. online or on-site exams, assignments, take-home exams, projects, etc. Following KMUTT's recommendations, the LOs evaluation should be organized at the end of each module.]

- The student's LOs will be evaluated based on Class participation / Evaluation for each module / Project presentation.

- Grading System:

Module 1            5% when the student submits the document to show the progress

Module 2            5% when the student submits the document to show the progress

Module 3            90% which come from the following

Final pitching (Project presentation)

- (10%) Project information (What is your project about? What does it provide to customers/users?)
- (50%) Business analysis (Thorough analysis is expected based on what you have learned in this class)
- (20%) Pitching content & presentation (Be informative but concise, good design, attention catching and persuasive)
- (10%) Submission of pitch deck (presentation PPT)

### Instructors:

1. Assoc. Prof. Dr. Suneerat Fukuda (Instructor and Course Coordinator)  
[E-mail: suneerat.pip@kmutt.ac.th]
2. Dr. Keita Ono, KX  
[E-mail: Keita@kxinnovation.com]
3. Mr. Radasiri Wachirapunyanont, WE4F  
[E-mail: radtasiri.w@gmail.com, r.wachirapunyanont@tetrattech.com]
4. Assoc. Prof. Dr. Chujit Treerattanaphan, School of Architecture and Design, KMUTT  
[E-mail: chujit.jea@gmail.com]

## 9. References/Resources

[Indicate the references/resources students are recommended to consult for the modules/course.]

Lecture notes and related literature distributed by the instructors.