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 may 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 2/2024, 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
Module 1: Introduction to entrepreneurships and innovation in energy, environment and sustainability 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	13 Jan	**Introduction of the course** • Ice breaking • Introduction of the course, expected learning outcome • Entrepreneur's Journey & Entrepreneurial mindset • Project idea (product/ service) identification	Students will be familiarized with the course and ready to go deeper with their idea project.	Dr. Suneerat Fukuda
2	20 Jan	**Core technology, core value and solution**	Students will get a better understanding of these terms with various examples	Dr. Keita Ono

Week	Date	Topic / Details	Learning outcome	Instructor
3	27 Jan	**Overview and trends of energy, environment and sustainability** • Current energy industry and future trend • Current environmental trend • Carbon neutrality/Net zero emission paradigm • Advanced technology and technology disruption	Students have knowledge and idea about the energy system and environmental trend as well as others that influence business creation and operation and why they are important.	Dr. Suneerat Fukuda
4	3 Feb	**Group presentation and discussion of selected case studies in energy, environment and sustainability**	Students can synthesize and identify the key concepts of entrepreneurships and innovation in energy, environment and sustainability	Dr. Suneerat Fukuda
Evaluation: • Group presentation and discussion of selected case studies				3 Feb
MODULE 2: Creating ideas with impact 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				
5	10 Feb	**Pain points identification and Ideation** • Design Thinking Process & Methods • Understanding Users • Insights Analysis • Project Brief • Ideation & Idea Screening Methods	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
6	17 Feb	**Business model canvas** • Business model canvas development to solve the identified problems	Students will be able to develop the business model canvas to analyze their project	Mr. Radtasiri Wachirapunyanont

Week	Date	Topic / Details	Learning outcome	Instructor
		• Market validation of the business model e.g. with target group of customers		
7	24 Feb	**Case studies of energy/ environment related business/startup**	Students will learn and be inspired from the real energy/environment related business/startup	TBD
8	3 Mar	**Project development update & feedback session**	Students will be able to convert what they learn in the class and self-learning to develop project idea with business model canvas, present and get feedback	Dr. Suneerat Fukuda
Evaluation: • Group presentation of project idea with business model canvas				3 Mar
MODULE 3: Developing and presenting a project 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				
9-12	10 Mar 17 Mar 24 Mar 31 Mar	**Product development**	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
No class on 7 Apr & 14 Apr – National holiday				
13	21 Apr	**Story telling & pitching skill** • Good story telling • Essential skills needed for pitching • Do's & Don'ts	Students will learn and improve their presentation skills	Mr. Radtasiri Wachirapunyanont
14	28 Apr	**Project development (cont.)**	Students will be able to finalize their idea project and prepare for pitching	Dr. Suneerat Fukuda
No class on 5 May & 12 May – National holiday				
15	19 May	**Final pitching**	Students will present their project and get comments	Dr. Suneerat Fukuda

Week	Date	Topic / Details	Learning outcome	Instructor
Evaluation: • Presentation of the project and submission of pitch deck				19 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 Evaluation for each module / Project presentation.
- Grading System:
  Module 1 10% based on participating presentation, Q&A
  Module 2 10% based on participating presentation, Q&A
  Module 3 80% which come from the following
  Final pitching (Project presentation)
  - (10%) Project information (What is your project about? What does it provide/deliver to customers?)
  - (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, submission of pitch deck)

Instructors:

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