SYE6012: TECHNOLOGICAL INNOVATION AND ENTREPRENEURSHIP

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Technological Innovation and Entrepreneurship

Subject Code
SYE - Systems Engineering
Course Number
6012

Academic Unit
Systems Engineering (SYE)

College/School
College of Engineering (EG)

Course Duration
One Semester

Credit Units
3

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
SEEM5010 Engineering Management Principles and Concepts (offered until 2021/22) or ADSE5010 Engineering Management Principles and Concepts or SYE5010 Engineering Management Principles and Concepts or an equivalent management course

Equivalent Courses
SEEM6012 Management of Technological Innovation (offered until 2021/22) / ADSE6012 Management of Technological Innovation (offered until 2023/24)

Exclusive Courses
Nil

Part II Course Details

Abstract

The aim of this course is to develop an understanding of the processes involved in developing innovative technological products, and of the skills and techniques that can be usefully employed to effectively manage development projects. At the conclusion of the course, the student is expected to:

- appreciate the nature of innovative work in order to provide a framework for understanding the skills and techniques needed to manage innovative development projects;
- understand the nature of management in innovative technological projects and the skills and techniques which can be employed in these situations;
- understand the issues and techniques valuable for managing new product design to ensure the development of high-quality, manufacturable and cost-effective products; and
- be aware of the market issues and economic aspects of technological product development projects.
- apply the EARS (Explore-Ask-Revise-Summarize) template and GenAI to enhance learning and creativity for class activities, individual assessments and group projects.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	To identify and describe new ideas developed from group discussion and brain storming. Both technology-push and market pull will be used as sources of new ideas.	20	x	x	x
2	To describe the basic process and principle of product and process innovation. To understand the different thinking pattern and work style along the process of innovation. To understand the difference between creative and critical thinking.	20	x		
3	To integrate managerial issues like marketing, finance and team management into new product development. To conduct an innovation project from an entrepreneurial perspective rather than an engineering perspective.	20	x	x	x
4	To Identify examples and cases of innovation in daily life and work in order to be inspired by the fact that innovation is every where.	10	x		
5	To combine all the relevant engineering and managerial theories and methods and apply them in formulating a complete innovation and entrepreneurship project plan. The final goal is to integrate your creative ideas, physical design, patent search, marketing plan and financial plan into a complete entrepreneurial package.	30	x	x	x

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Class activities	Including lecturing, discussion, questioning, answering questions, participating in class assessments.	1, 2, 3, 4, 5	26 hrs/sem
2	Group project and tutorial	Including idea generation, product design, market research, financial analysis and project report.	1, 2, 3, 4, 5	13 hrs/sem

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Class activities	1, 2, 3, 4, 5	5	GenAI is permitted, free style	Yes
2	Individual assignments	1, 2, 3, 4, 5	15	GenAI is permitted under the EARS template	Yes
3	Mid-term test	3, 4	5	No	No
4	Group project	1, 2, 3, 4, 5	35	GenAI is permitted under the EARS template	Yes
5	Individual final report by a test	1, 2, 3, 4, 5	40	No	No

Continuous Assessment (%)

100

Examination (%)

0

Examination Duration (Hours)

0

Minimum Continuous Assessment Passing Requirement (%)

50

Minimum Examination Passing Requirement (%)

0

Additional Information for ATs

There is no examination in this course, 100% on course work.

Assessment Rubrics (AR)

Assessment Task
1. Class activities (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Active participation in class activities is measured each time, plus 80% of attendance.

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
2. Individual assignments (for students admitted before Semester A 2022/23 and in Semester 2024/25 & thereafter)

Criterion
Submit the assignment and fulfil the requirement of problem identification measured by the level of degree, duration and demand and creativity of idea generated.

Excellent
High

Good
Significant

Fair
Moderate

Marginal
Basic

Failure
Fail to submit or did meet the requirement at all

Assessment Task
3. Mid-term test (for students admitted before Semester A 2022/23 and in Semester 2024/25 & thereafter)

Criterion
Normative test of understanding of lecturing until the middle of the semester， understanding of business model and business plan as well as their differences and relationships by multiple choice

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Fair
(B-,) Moderate

Marginal
(C+, C) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
4. Group project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Overall assessment of problem painfulness 20%, idea creativity20%, product feasibility20% and business viability20%, plus teamwork and peer assessment 20%.

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
5. Individual report (for students admitted before Semester A 2022/23 and in Semester 2024/25 & thereafter)

Criterion
Individual reports with certain time limitation as a summative assessment of student skills and ability to apply knowledge's to solve a particular innovation and entrepreneurial topic. Overall assessment of problem painfulness 20%, idea creativity20%, product feasibility20% and business viability20%, plus within team peer assessment 20%.

Excellent
High

Good
Significant

Fair

Good

Marginal
Marginal

Failure
Poor

Assessment Task
1. Class activities (for students admitted from Semester A 2022/23 and Summer Term 2024)

Criterion
Active participation in class activities is measured each time, plus 80% of attendance.

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Fair
(B-, C+, C) Moderate/Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
2. Individual assignments (for students admitted from Semester A 2022/23 and Summer Term 2024)

Criterion
Submit the assignment and fulfil the requirement of problem identification measured by the level of degree, duration and demand and creativity of idea generated.

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Fair
(B-, C+, C) Moderate/Basic

Failure
Fail to submit or did meet the requirement at all

Assessment Task
3. Mid-term test (for students admitted from Semester A 2022/23 and Summer Term 2024)

Criterion

Normative test of understanding of lecturing until the middle of the semester, understanding of business model and business plan as well as their differences and relationships by multiple choice.

Excellent

(A+, A, A-) High

Good

(B-, C+, C) Moderate/Basic

Fair

(B-, C+, C) Moderate/Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

4. Group project (for students admitted from Semester A 2022/23 and Summer Term 2024)

Criterion

Overall assessment of problem painfulness 20%, idea creativity20%, product feasibility20% and business viability20%, plus teamwork and peer assessment 20%.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Fair

(B-, C+, C) Moderate/Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

5. Individual report (for students admitted from Semester A 2022/23 and Summer Term 2024)

Criterion

Individual reports with certain time limitation as a summative assessment of student skills and ability to apply knowledge's to solve a particular innovation and entrepreneurial topic. Overall assessment of problem painfulness 20%, idea creativity20%, product feasibility20% and business viability20%, plus within team peer assessment 20%.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Fair

(B-, C+, C) Moderate/Basic

Failure

(F) Not even reaching marginal levels

Additional Information for AR

Class activities: Including Q&A, attendance, and class activities. A scorecard will be used to measure how active a group will be in the class. For all the questions asked in the class, a score will be given and recorded.
Group project: Including a written report, the final presentation, and peer assessment . Individual report will be conducted either in a 2-hour session under the supervision without internet and AI.

Part III Other Information

Keyword Syllabus

- Creativity, innovation and entrepreneurship
- Creative things and idea generation
- Sources of innovation
- Entrepreneurial personality
- Technology forecasting and assessment
- Innovative team
- Innovative organization
- Management fundamentals for innovation project
- Basic marketing and financial issues for innovation

Reading List

Compulsory Readings

	Title
1	Dorf, R. C. and Byers, T. H. (2005) Technology Ventures: From Idea to Enterprise, McGraw Hill, Singapore.

Additional Readings

	Title
1	Carayannis, Elias G. 2001, Strategic Management of Technological Learning, USA: CRC Press.
2	Christiansen, James A. 2000, Building the Innovative Organization: Management System that Encourage Innovation, USA: St. Martin’ s Press, Inc.
3	Drucker, Peter F. 1993, Innovation and Entrepreneurship: Practice and Principles, NY: Harper Business.
4	Hofstede, Geert H. 1997, Cultures and Organizations: Software of the Mind, UK: McGraw-Hill.
5	Jay, Ros 2000, The Ultimate book of Business Creativity: 50 Great Thinking Tools for Transforming your Business, UK: capstone Publishing.
6	Ricchiuto, J. 1997, Collaborative Creativity: Unleashing the Power of Shared Thinking, Akron & New York Oakhill Press.
7	Sherwood, Daniel 2002, Creating an Innovative Culture, UK: Capstone Publishing.
8	Smith, D (2006) Exploring Innovation, McGraw-Hill.
9	Tushman, Michael L. and Anderson, P. 1997, Managing Strategic Innovation and Change: a Collection of Readings, NY: Oxford University Press.