SYE6012: TECHNOLOGICAL INNOVATION AND ENTREPRENEURSHIP

Effective Term Semester B 2024/25

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

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 highquality, manufacturable and cost-effective products; and
- · be aware of the market issues and economic aspects of technological product development 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

3 SYE6012: Technological Innovation and Entrepreneurship

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

	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

Learning and Teaching Activities (LTAs)

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Class activities	1, 2, 3, 4, 5	20	
2	Group project	1, 2, 3, 4, 5	40	
3	Continuous tests	1, 2, 3, 4, 5	40	

Continuous Assessment (%)

100

Assessment Rubrics (AR)

Assessment Task

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

Criterion

Active participation in class activities measured each time.

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

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

Criterion

Contribution to group project in terms of problem, idea, product concept and/or business plan preparation, plus peer assessment.

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

Continuous tests (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Identification of programmes and provide potential solutions.

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

Class activities (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Active participation in class activities measured each time.

Excellent

(A+, A, A-) High

Good (B+, B) Significant

Marginal

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

Failure

(F) Not even reaching marginal levels

Assessment Task

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

Criterion

Contribution to group project in terms of problem, idea, product concept and/or business plan preparation, plus peer assessment.

Excellent (A+, A, A-) High

Good (B+, B) Significant

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

Failure (F) Not even reaching marginal levels

Assessment Task

Continuous tests (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Identification of programmes and provide potential solutions.

Excellent (A+, A, A-) High

Good (B+, B) Significant

Marginal (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, peer assessment and a preliminary patent application

Group project: Including a written report, the final presentation, peer assessment and a preliminary patent application form. The distribution of the scores among team members will be adjusted by peer assessment. Continuous tests: Continuous tests will be conducted in the middle and the end of the semester.

Part III Other Information

Keyword Syllabus

- · Creativity, innovation and entrepreneurship
- \cdot $\,$ Creative thing and idea generation
- · Sources of innovation
- \cdot $\,$ Technology for ecasting 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.