

SYE6017: INTEGRATIVE ENGINEERING MANAGEMENT

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Integrative Engineering Management

Subject Code

SYE - Systems Engineering

Course Number

6017

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

Equivalent Courses

SEEM6017 Integrative Engineering Management / ADSE6017 Integrative Engineering Management

Exclusive Courses

Nil

Part II Course Details

Abstract

This course aims to provide a supportive, directed experiential and cooperative learning environment for students to acquire and develop the set of strategic managerial skills and application abilities needed for solving diverse engineering management problems strategically important to company or industry. The course emphasizes on the challenges to strategic management; including the contemporary and historical issues of globalization facing engineering enterprises.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Sharpen and broaden the knowledge in strategic engineering management	20	x		
2	Apply the teamwork, leadership and other managerial skills to get the best out of engineering management project teams	30	x		
3	Identify some strategic important issues and problems in complex business environment	20	x	x	x
4	Integrate engineering management knowledge and skills to solve diverse Engineering Management problems with strategic importance to company or industry	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	Large Class lectures (i)	Formal lecture, discussion, Q&A	1, 3	12 hrs/sem
2	Action learning activities (ii)	Problem identification & solving, action learning	1, 3, 4	6 hrs/sem
3	Group-based Problem Solving Projects (iii)	Problem identification, cooperative and experiential learning.	2, 3, 4	21 hrs/sem

Additional Information for LTAs

(i) Emphasis of large class activities is placed on the conceptual understanding and practical applications of various strategic engineering management topics.

(ii) A number of exercises or case studies will be assigned to individual students during the course. Through these assignments, the students should have acquired a clearer understanding of the content of the course and be able to apply the strategic engineering management principles and concepts to solve problems in the group-based project.

(iii) A Learning Group comprises about 6-8 students working together to solve the strategic important problems in the context of engineering management. Each student is expected to be actively involved in the process of diagnosing and taking actions on solving strategic important problems. The group will meet at regular intervals with a view of capturing and focusing on the learning, which is taking place through the problem solving process. It is essential for "real" dialogue about real problems and "real" feelings to take place, if there is to be meaningful learning. To avoid group meetings becoming merely interesting discussions, real work on problems must take place between meetings. These group-based projects provide students with the opportunities to apply the strategic engineering management concepts and associated methodologies to identify and solve real-life problems for engineering enterprises.

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("- " for nil entry)	Allow Use of GenAI?
1	Written Test	1, 3	30	-	No
2	Individual Assignment/case study reports	1, 2, 3, 4	20	-	No
3	Group-based projects: group reports and presentations	1, 2, 3, 4	50	-	No

Continuous Assessment (%)

100

Examination (%)

0

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

0

Additional Information for ATs

*2.5% will be assigned according to the peer evaluation results.

The written test (30%) is to assess whether students can list and explain the knowledge in Strategic Engineering Management and recognize the field of knowledge in strategic EM and its application to solve strategic important problems. It is inappropriate to use just written test to assess individual or team project works. A process of continuous assessment (70%) is used to supplement the written test based on attendance, individual and group performance reflecting on problem solving and other managerial skills development in the course. The participative and cooperative nature of the learning methods used also makes assessment by continuous assessment appropriate.

- Individual assignments/reports and presentations are used to assess student's level of achievement of the intended learning outcomes, with balanced emphasis placed on both conceptual understanding and practical applications of the various engineering management topics.
- The group performance, presentations and reports during the course assess students' understanding of the strategic engineering management issues. Their commitment to the group and the learning objectives of the course are also sought for.
- Students' ability to identify engineering management problems and adopt a structured and fact-based approach of problem solving is assessed through project team reports and presentations during and after the study process. Such achievement should be observable throughout the stream of problem identification and justification, data collection and root cause analysis leading to improvement suggestions.

Assessment Rubrics (AR)

Assessment Task

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

Criterion

Accuracy and quality of answers to the questions

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

Individual Assignment/case study reports (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Quality of the submitted works

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-based projects: group reports and presentations (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

individual performance in group, submitted group report and presentation

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

Written Test (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Accuracy and quality of answers to the questions

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

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

Failure

(F) Not even reaching marginal levels

Assessment Task

Individual Assignment/case study reports (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Quality of the submitted works

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-based projects: group reports and presentations (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

individual performance in group, submitted group report and presentation

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

- The students' performance in the written test.
- Individual and group assignments/reports/presentations will be numerically-marked and grades awarded accordingly.
- * Peer assessment: At the end of the group-based project, each student will be asked to assess different members of the group objectively. This is used to differentiate the project contribution from each member of a group and their effectiveness as a team player. The results will be used to calculate the final project mark for each student with the aids of instructors' evaluation.

Part III Other Information

Keyword Syllabus

- Strategic engineering management process in practice: internal organization analysis, external environmental analysis, strategic alternative analysis, formulating corporate and business strategies, implementing corporate and business strategies, strategic control and evaluation aspects.
- Group and team dynamics. Leadership models. Motivation models, Communication models. Conflict resolution models. The management of corporate values and culture. Management of change and organizational development.
- Problem identification and solving techniques, Project planning and control, Reporting and presentation

Students will work in cooperative teams on simulated multi-disciplinary projects related to the practice of Engineering Management. In addition to the written test and the successful completion of the assigned project tasks, students are required to learn through collaborative actions in order to improve their understanding on strategic thinking, problem solving, team working processes, the relationships and interactions between the fields of knowledge that they have learnt in this and other courses.

Reading List

Compulsory Readings

Title	
1	NIL

Additional Readings

Title	
1	T L Wheelen & J D Hunger - Strategic Management and Business Policy, 11E, Pearson
2	M A Hitts R D Ireland & R E Hoskisson - Strategic Management, Competitiveness and Globalization: Concepts and Cases, 7th Edition, Thomson/South-western, 2007

3	J B Barney & W S Hesterly – Strategic Management and Competitive Advantage, Concepts and Cases, 2E, Pearson
4	S.P. Robbins & M. Coulter, Management, 9th Edition, Pearson.
5	G.R. Jones and J.M. George, Essentials of Contemporary Management, 2nd edition, 2007, McGraw-Hill.
6	R.M. Belbin, Management Teams: Why they succeed or fail, 2004, Heinemann.