

# SYE8024D: INTEGRATIVE ENGINEERING MANAGEMENT

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## Effective Term

Semester B 2024/25

## Part I Course Overview

### Course Title

Integrative Engineering Management

### Subject Code

SYE - Systems Engineering

### Course Number

8024D

### Academic Unit

Systems Engineering (SYE)

### College/School

College of Engineering (EG)

### Course Duration

One Semester

### Credit Units

3

### Level

D8 - Professional Doctorate

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

Nil

### Precursors

Nil

### Equivalent Courses

SEEM8024D Integrative Engineering Management (offered until 2021/22);  
ADSE8024D Integrative Engineering Management (offered until 2023/24)

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

This course provides theoretical background and knowledge for students to acquire and develop the set of strategic organizational and managerial skills and innovative capabilities in solving strategic and operational engineering/technology management problems.

### Course Intended Learning Outcomes (CILOs)

| CILOs |                                                                                                                                              | Weighting (if app.) | DEC-A1 | DEC-A2 | DEC-A3 |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------|--------|--------|
| 1     | Describe and interrelate the knowledge in strategic engineering management                                                                   |                     | x      | x      |        |
| 2     | Recognize the degree to which the organizational adjustments needed to compete in different industries                                       |                     | x      | x      |        |
| 3     | Formulate organizational strategies that map firm strengths on to environmental opportunities                                                |                     | x      | x      | x      |
| 4     | Identify problems from a strategic management perspective and propose innovative measures to resolve diverse Engineering Management problems |                     | 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 activities/ Directed Studies (i)                                                   | See remarks (i)   | 1          | 6 hours/sem                |
| 2    | Individual Assignments/ appreciation of literature/ group discussion(ii)                       | See remarks (ii)  | 1, 2, 3, 4 | 8 hours/sem                |
| 3    | Group discussion/ Individual report/ presentation on individual project ideas/ definition(iii) | See remarks (iii) | 2, 3, 4    | 25 hours/sem               |

### Additional Information for LTAs

Remarks

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

(ii) A Learning Group comprises about 6-8 students working together to help each other in working out the following through group discussion, individual presentation, Q & A and individual report:

- Individual assignment: A 5 years strategic plan for each student's own company
- Identify strategic important problem areas to student's company or industry
- Extensive literature appreciation with possible innovative measures to resolve the identified problem areas
- Project ideas possibly be developed as the student's EngD project proposal

(iii) Each student is expected to be actively involved in the process of diagnosing and taking actions to help each other on solving each other's 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 activities 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 and innovative solutions.

#### Assessment Tasks / Activities (ATs)

| ATs |                                                                                  | CILO No. | Weighting (%) | Remarks (e.g. Parameter for GenAI use) |
|-----|----------------------------------------------------------------------------------|----------|---------------|----------------------------------------|
| 1   | Individual Assignment:<br>Individual feedback to others/Presentation / report    | 1, 2, 3  | 20            |                                        |
| 2   | Literature appreciation:<br>Individual feedback to others/presentation & report  | 1, 2, 3  | 20            |                                        |
| 3   | Individual project ideas:<br>Individual feedback to others/presentation & report | 2, 3, 4  | 60            |                                        |

#### Continuous Assessment (%)

100

#### Examination (%)

0

#### Minimum Continuous Assessment Passing Requirement (%)

0

#### Minimum Examination Passing Requirement (%)

0

#### Additional Information for ATs

It is inappropriate to use written examination to assess individual or group works. A process of continuous assessment is used to replace the written test based on attendance, individual and group performance reflecting on literature appreciation, problem identification and strategic analysis works 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 strategic engineering management topics.

- The individual/group performance, presentations and reports during the course assess students' understanding of the strategic engineering management issues. Their commitment/feedback to help each other in group and the learning objectives of the course are also sought for.
- Students' ability to identify engineering management problems with creative measures for improvements is assessed through project report and presentation 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**

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

#### **Criterion**

Individual feedback to others/Presentation /report

#### **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

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#### **Assessment Task**

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

#### **Criterion**

Individual feedback to others/presentation & report

#### **Excellent**

(A+, A, A-) High

#### **Good**

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**Assessment Task**

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

**Criterion**

Individual feedback to others/presentation & report

**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

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**Assessment Task**

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

**Criterion**

Individual feedback to others/Presentation /report

**Excellent**

(A+, A, A-) High

**Good**

(B+, B) Significant

**Marginal**

(B-, C+, C) Basic

**Failure**

(F) Not even reaching marginal levels

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**Assessment Task**

Literature appreciation (for students admitted from Semester A 2022/23 to Summer Term 2024)

**Criterion**

Individual feedback to others/presentation & report

**Excellent**

(A+, A, A-) High

**Good**

(B+, B) Significant

**Marginal**

(B-, C+, C) Basic

#### Failure

(F) Not even reaching marginal levels

#### Assessment Task

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

#### Criterion

Individual feedback to others/presentation & report

#### Excellent

(A+, A, A-) High

#### Good

(B+, B) Significant

#### Marginal

(B-, C+, C) Basic

#### Failure

(F) Not even reaching marginal levels

## 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.

- Problem identification and solving techniques, Project planning and control, Reporting and presentation

Students will work in cooperative teams on multi-disciplinary projects related to the practice of Engineering Management.

In addition to the successful completion of the assigned tasks, students are required to learn through collaborative actions in order to improve their understanding on creative strategic thinking, innovative 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     | T L Wheelen & J D Hunger - Strategic Management and Business Policy, 11E, Pearson |

##### Additional Readings

| Title |                                                                                                                                                                |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | M A Hitts, R D Ireland & R E Hoskisson - Strategic Management, Competitiveness and Globalization: Concepts and Cases, 7th Edition, Thomson/South-western, 2007 |
| 2     | J B Barney & W S Hesterly - Strategic Management and Competitive Advantage, Concepts and Cases, 2E, Pearson                                                    |
| 3     | G.R. Jones and J.M. George, Essentials of Contemporary Management, 2nd edition, 2007, McGraw-Hill.                                                             |