

ADSE2066: PROFESSIONAL ENGINEERING PRACTICE

Effective Term

Semester A 2023/24

Part I Course Overview

Course Title

Professional Engineering Practice

Subject Code

ADSE - Advanced Design and System Engineering

Course Number

2066

Academic Unit

Systems Engineering (SYE)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

SEEM4066 Professional Engineering Practice

Exclusive Courses

Nil

Part II Course Details

Abstract

This course provides an over-arching coverage of the role of engineers with essential knowledge to be professional engineer in modern society. It strengthens students' assimilation of fundamental engineering and technical subject matters of BEng in Intelligent Manufacturing Engineering programme and their appreciation of modern engineering's technology, environmental and socio-economic factors (economic, ethics, etc.) implications.

With the increasing integration of the industrial fabrics of Hong Kong, Guangdong-Hong Kong-Macao Greater Bay Area, and Greater China, the course will also examine the role of engineering related to advanced manufacturing, entrepreneurship, start-up management, professional services, as well as, innovation and technology disciplines. Eminent industrialists will be invited to give guest lectures to provide students with the most updates of the industrial community.

Course Intended Learning Outcomes (CILOs)

| CILOs | | Weighting (if app.) | DEC-A1 | DEC-A2 | DEC-A3 |
|-------|--|---------------------|--------|--------|--------|
| 1 | Describe and apply basic engineering concepts and principles to analyze and improve simple manufacturing systems. | 35 | x | | |
| 2 | Describe the role of an engineer in sustainable development, environmental protection, health and safety management, innovation and technology management in the manufacturing industry. | 15 | x | | |
| 3 | Clarify the legal responsibilities and ethical obligations of a professional engineer in modern society. | 15 | x | | |
| 4 | Recognize the need for, and to engage in staying abreast of contemporary issues in engineering. | 10 | x | | |
| 5 | Communicate effectively the outcome of group work and individual assignment. | 10 | x | x | |
| 6 | Recognize the need for, and to engage in life-long learning. | 15 | 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.

Teaching and Learning Activities (TLAs)

| TLAs | | Brief Description | CILO No. | Hours/week (if applicable) |
|------|---------|--|------------------|----------------------------|
| 1 | Lecture | Lectures, in-class exercises, in-class Q&A and discussions will be used to implement CILOs 1-6. Professional engineers and industrialists will be invited as guest lecturers to enrich students' learning. | 1, 2, 3, 4, 5, 6 | 3 hours/week |

Assessment Tasks / Activities (ATs)

| ATs | CILO No. | Weighting (%) | Remarks (e.g. Parameter for GenAI use) |
|-----|--|------------------|--|
| 1 | Case studies, mini-projects, homework sets | 1, 2, 3, 4, 5, 6 | 45 |

Continuous Assessment (%)

45

Examination (%)

55

Examination Duration (Hours)

2

Additional Information for ATs

For a student to pass the course, at least 30% of the maximum mark for the examination should be obtained.

Assessment Rubrics (AR)**Assessment Task**

Coursework

Criterion

Achieve all MILOs by group work and individual assignments

Excellent (A+, A, A-)

High (overall score more than 80%)

Good (B+, B, B-)

Significant (overall score more than 60%)

Fair (C+, C, C-)

Moderate (overall score more than 40%)

Marginal (D)

Basic (overall score more than 30%)

Failure (F)

Not even reaching marginal levels (overall score less than 30%)

Assessment Task

Examination

Criterion

Achieve all MILOs by reflected by examination results

Excellent (A+, A, A-)

High (score more than 80%)

Good (B+, B, B-)

Significant (score more than 60%)

Fair (C+, C, C-)

Moderate (score more than 40%)

Marginal (D)

Basic (score more than 30%)

Failure (F)

Not even reaching marginal levels (score less than 30%)

Part III Other Information**Keyword Syllabus**

- Industrial and advanced manufacturing environment of Hong Kong, China and the world
- Basic concepts and principles for process analysis in manufacturing systems.
- Engineers in society, private and public sectors - sustainability development, quality, safety and health, professional ethics and legal responsibilities
- Innovative and creative thinking. and their importance to life-long learning
- Engineers in society – Entrepreneurship, Start-up ecosystem, Environment protection and social responsibilities
- Current and future development of engineers in Intelligent Manufacturing Engineering discipline, and career prospect

Reading List**Compulsory Readings**

| Title | |
|-------|-----|
| 1 | Nil |

Additional Readings

| Title | |
|-------|--|
| 1 | Karen Gadd (2011) “TRIZ for Engineers: Enabling Inventive Problem Solving” , Wiley |
| 2 | Peter Thiel (2014) “Zero to One: Notes on Startups, or How to Build the Future” |
| 3 | Kai-Fu Lee (2018) “AI Super-Powers: China, Silicon Valley and the New World Order” , Houghton Mifflin Harcourt |
| 4 | Engineering peace and justice : the responsibility of engineers to society by P. Aarne Vesilind. New York ; London : Springer, 2010. |
| 5 | Alexander Osterwalder & Yves Pigneur (2010) “Business Model Generation : A Handbook for Visionaries, Game Changers, and Challengers” , Wiley |

| | |
|---|---|
| 6 | Ethics in science and engineering by James G. Speight and Russell Foote. Hoboken, N.J. : Wiley ; Salem, Mass. : Scrivener, c2011. |
| 7 | Factory Physics, 3rd Edition, Wallace Hopp and Mark Spearman, Waveland Press, 2011. |