

BME4066: PROFESSIONAL ENGINEERING PRACTICE

Effective Term

Semester B 2022/23

Part I Course Overview

Course Title

Professional Engineering Practice

Subject Code

BME - Biomedical Engineering

Course Number

4066

Academic Unit

Biomedical Engineering (BME)

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

Normative 4-year degree students must complete a minimum of 72 CUs to be eligible

Advanced Standing I students must complete a minimum of 42 CUs to be eligible

Advanced Standing II students must complete a minimum of 21 CUs to be eligible

Precursors

Nil

Equivalent Courses

MBE4066/BME2066/MNE4066/SEEM4066 Professional Engineering Practice

Exclusive Courses

Nil

Part II Course Details

Abstract

This course provides an over-arching coverage of the role of engineers in society. It strengthens students' assimilation of fundamental engineering and technical subject matters of a BEng programme and their appreciation of modern engineering's economic, political, environmental and ethical implications.

With the increasing integration of the industrial fabrics of Hong Kong and Southern China, the course will also examine on the role of engineering in the past and future development of the biomedical, manufacturing, biosafety, sustainability and healthcare industry in Hong Kong but with a global and societal context.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if DEC-A1 DEC-A2 DEC-A3 app.)			
1	Explain the impact of technology and engineering on the daily life, economy, and politics of today's society.		x	x	
2	Discuss the role of an engineer in environmental protection and health and safety in the workplace.		x	x	
3	Distinguish the legal responsibilities and ethical obligations of a professional engineer.		x	x	
4	Describe the role of engineering in the development of related industries in Hong Kong, China and globally.			x	
5	Communicate effectively the outcome of group work and individual assignment.			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	Made up of a mixture of lectures and group work. Professional engineers, eminent industrialists and ICAC officers will be invited as guest lecturers to enrich students' learning. Students' learning on each lecture topic is complemented by selected case studies and group work. Tutorials provide the forum for case analyses, topical discussions and interactions among students and tutor.	1, 2, 3, 4	3 hrs/week
2	Workshop	Students attend 3 sessions of equipment workshop in the hospital.	1, 2, 4, 5	3 hrs/session, 3 sessions

Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)	
1	Group Project	1, 2, 3, 4, 5	50	Proposal write-up, Case Analyses and Discussions + Presentation. All together each group work will be assessed 3 times during the stage of project proposal (10%), presentation (20%) and the final write-up (20%).
2	Assessment on English presentation skill	1, 2, 3, 4, 5	10	
3	Workshop Report	1, 2, 4, 5	10	Assignment on the equipment workshop

Continuous Assessment (%)

70

Examination (%)

30

Examination Duration (Hours)

1.5

Additional Information for ATs

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

Assessment Rubrics (AR)

Assessment Task

1. Group Project

Criterion

1.1 Ability to Identify and Balance between engineering development with broad spectrum of issues including but not limited to cultural, professional, legal, social, economic, safety and health, and environmental aspects.

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. Assessment on English presentation skill

Criterion

2.1 Ability to identify broad spectrum of issues including but not limited to cultural, professional, legal, social, economic, safety and health, and environmental aspects.

2.2 Ability to effectively communicate professionally as an engineer.

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

3. Workshop Report

Criterion

3.1 Ability to identify broad spectrum of issues including but not limited to cultural, professional, legal, social, economic, safety and health, and environmental aspects.

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

4. Examination

Criterion

4.1 Ability to identify broad spectrum of non-engineering issues including but not limited to cultural, professional, legal, social, economic, safety and health, and environmental aspects.

4.2 Ability to apply engineering ethics in engineering related works.

4.3 Ability to balance between engineering ethics and competitiveness.

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

Part III Other Information

Keyword Syllabus

- Related industrial environment of Hong Kong, China and the world.
- Engineers in private practices and public sectors - safety and health, professional ethics and legal responsibilities.
- Innovative and creative design – patents and copyrights.
- Engineers in society – environment protection and social responsibilities.
- Role of Biomedical Engineering in creating a better and sustainable society.

Reading List**Compulsory Readings**

Title	
1	Nil

Additional Readings

Title	
1	Charles E. Harris, Michael S. Pritchard & Michael J. Rabins, Engineering Ethics: Concepts and Cases, Belmont, California: Wadsworth, ISBN: 978-0495502791.
2	Charles B. Fleddermann, Engineering Ethics, Upper Saddle River: Prentice Hall, ISBN: 9780132145213.
3	Carl Mitcham & Shannon R. Duval, Engineer's Toolkit: A First Course in Engineering-Engineering Ethics, Upper Saddle River, N.J.: Prentice Hall, ISBN: 978-0805364361.