

**City University of Hong Kong
Course Syllabus**

**offered by
Department of Mechanical Engineering
with effect from Semester A 2022 / 23**

Part I Course Overview

Course Title:	Engineering Methods
Course Code:	MNE8108
Course Duration:	1 semester
Credit Units:	3 credits
Level:	R8
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: <i>(Course Code and Title)</i>	Nil
Precursors: <i>(Course Code and Title)</i>	Calculus and computational coursework of a Bachelor's degree in mechanical/nuclear engineering or equivalent majors
Equivalent Courses: <i>(Course Code and Title)</i>	MNE6125 Engineering Methods
Exclusive Courses: <i>(Course Code and Title)</i>	Nil

Part II Course Details

1. Abstract

The course is to teach advanced knowledge of mathematical and numerical methods for to the students who are seeking a degree of Doctor of Philosophy in the major of mechanical engineering or nuclear engineering. The topics include linear algebra, partial differential equations, data science, basic concepts of numerical methods, and so on.

2. Course Intended Learning Outcomes (CILOs)

No.	CILOs	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Describe the concepts of engineering methods and their impacts on the research and development of mechanical or nuclear engineering.			✓	
2.	Formulate mechanical/nuclear related equations with proper analytical or numerical methods.		✓	✓	
3.	Identify and implement the proper analytical or numerical method for solving a specific type of engineering problem; recognize the advantages, disadvantages and limitations of the methods.		✓	✓	
4.	Identify and implement the proper method for analysing a specific group of data; recognize the advantages, disadvantages and limitations of the method.		✓	✓	

* If weighting is assigned to CILOs, they should add up to 100%.

N.A.

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 self-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.

3. Teaching and Learning Activities (TLAs)

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
Lecture	Take place in classroom which consists of lectures on different engineering mechanics concepts and applications.	✓	✓	✓	✓	2 hrs/week for 13 weeks
Tutorial	Take place in classroom which consists of tutorials and student activities on learning different engineering mechanics concepts and applications.	✓	✓	✓	✓	1 hr/week for 13 weeks

4. Assessment Tasks/Activities (ATs)

Assessment Tasks/Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: 70%						
Tests/ Assignments	✓	✓	✓	✓	30%	
Mini-project/ Lab	✓	✓	✓	✓	40%	
Examination: 30% (duration: 2 hours)						
Examination	✓	✓	✓	✓	30%	
* The weightings should add up to 100%.					100%	

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

5. Assessment Rubrics

Applicable to students admitted in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
Examination	Describe the fundamental concepts of applied mechanics and apply them to explain mechanical behavior of solid materials; Analyse and calculate the problems with mechanics theory.	High	Significant	Moderate	Not even reaching marginal levels
Test/ Assignment	Describe the fundamental concepts of applied mechanics and apply them to explain mechanical behavior of solid materials; Analyse and calculate the problems with mechanics theory.	High	Significant	Moderate	Not even reaching marginal levels
Mini-project/ Lab	Ability to conduct effective literature survey, analyse the problem with been taught concepts and theories, and demonstrate the idea with a mini-project. Attendance of the lab session; Ability to explain the methodology and procedure and analyse the lab data/phenomena.	High	Significant	Moderate	Not even reaching marginal levels

Applicable to students admitted before Semester A 2022/23

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
Examination	Describe the fundamental concepts of applied mechanics and apply them to explain mechanical behavior of solid materials; Analyse and calculate the problems with mechanics theory.	High	Significant	Moderate	Basic	Not even reaching marginal levels
Test/ Assignment	Describe the fundamental concepts of applied mechanics and apply them to explain mechanical behavior of solid materials; Analyse and calculate the problems with mechanics theory.	High	Significant	Moderate	Basic	Not even reaching marginal levels
Mini-project/ Lab	Ability to conduct effective literature survey, analyse the problem with been taught concepts and theories, and demonstrate the idea with a mini-project. Attendance of the lab session; Ability to explain the methodology and procedure and analyse the lab data/phenomena.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

Linear algebra, partial differential equations, data science, basic concepts of numerical methods, and so on.

2. Reading List

2.1 Compulsory Readings

1.	Lecture notes
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2.2 Additional Readings

Students are encouraged to seek out related textbooks and research publication to widen their scope in the subjects.