

**City University of Hong Kong  
Course Syllabus**

**offered by  
Department of Architecture and Civil Engineering  
with effect from Semester A 2022 / 2023**

**Part I Course Overview**

<b>Course Title:</b>	Advanced Mechanics
<b>Course Code:</b>	CA8006M
<b>Course Duration:</b>	1 Semester (Some courses offered in Summer Term may start a few weeks earlier than the normal University schedule. Please check the teaching schedules with CLs before registering for the courses.)
<b>Credit Units:</b>	3
<b>Level:</b>	R8
<b>Medium of Instruction:</b>	English
<b>Medium of Assessment:</b>	English
<b>Prerequisites:</b> <i>(Course Code and Title)</i>	Nil
<b>Precursors:</b> <i>(Course Code and Title)</i>	Nil
<b>Equivalent Courses:</b> <i>(Course Code and Title)</i>	BC8006M Advanced Mechanics
<b>Exclusive Courses:</b> <i>(Course Code and Title)</i>	Nil

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## Part II Course Details

### 1. Abstract

The course provides fundamental knowledge and classical principles in continuum mechanics including the theory on elasticity and plasticity and expands the horizons on applied mechanics of the attendees.

### 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.	discover the fundamental principles of continuum mechanics;	30%	✓	✓	
2.	analyze and apply continuum mechanics using tensor analysis;	30%	✓	✓	
3.	discover the concepts on stress and strain in three-dimension domain; and	20%		✓	✓
4.	discover and apply the advanced topics in elasticity and Lagrangian rigid body dynamics.	20%		✓	✓
* If weighting is assigned to CILOs, they should add up to 100%.		100%			

#### 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	
Lectures	Introducing theory, concepts and problem solving	✓	✓	✓	✓	
Tutorials	Introducing theory, concepts and problem solving	✓	✓	✓	✓	

Semester Hours:	3 hours per week
Lecture/Tutorial/Laboratory Mix:	Lecture (-); Tutorial (-); Laboratory (-)
	Three hours per week including lectures and tutorials. Lectures and tutorials will be conducted in class and/or online via internet.

### 4. Assessment Tasks/Activities

Assessment Tasks / Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: 100%						
Tests and/or assignments	✓	✓	✓	✓	100%	
Examination: 0%						
* The weightings should add up to 100%.					100%	

## 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)
Tests and/or assignments	Ability to understand and apply the scientific methods in solving theoretical and application problems.	High	Significant	Basic	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)
Tests and/or assignments	Ability to understand and apply the scientific methods in solving theoretical and application problems.	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**

Elasticity: State of stress and strain at a point, stress-strain relationships; Curved beams, beams on elastic foundations

Non-linear mechanics: Bifurcation, and Chaos; Fractal, Fourier and p-elements; Monte Carlo simulation

Plasticity

**2. Reading List**

**2.1 Compulsory Readings**

1.	Nil
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**2.2 Additional Readings**

1.	Eutiquio C. Young, Vector and Tensor Analysis, Marcel Dekker, Inc., New York, 1993.
2.	Y.C. Fung, Foundations of Solid Mechanics, Prentice Hall, Inc., New Jersey, 1965.