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

Course Title:	Wind Engineering
Course Code:	CA8009
Course Duration:	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.)
Credit Units:	3
Level:	R8
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	Nil
Precursors: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	BC8009 Wind Engineering
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

This course is intended to introduce wind engineering, with particular reference to wind-induced loads acting on and responses of civil engineering structures. The course will enable students to determine wind effects on structures using design codes, wind tunnel test techniques and computational methods.

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.	apply fundamental principles of wind engineering theory to determine wind effects on civil engineering structures;	40%	✓	✓	✓
2.	apply wind loading codes for structural design;	20%		✓	
3.	apply experimental methods for determining wind effects on buildings and structures;	20%	✓	✓	
4.	discover and analyze structural responses under wind action.	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	
Lecture and Tutorials	(1)general characteristics of wind actions and associated damages including wind storm, wind damage, atmospheric boundary layer, wind turbulence, bluff-body aerodynamics ; (2) introduction of wind codes for structural design (learn how to use the Code of Practice on Wind Effects, Hong Kong-2004 and other wind loading codes) ; (3) experimental methods of determining wind effects (wind tunnel tests and full-scale measurements) ; (4)determination of structural responses under wind action (effective static loading distributions, structural dynamic analysis and applications of computational fluid dynamics technique).	✓	✓	✓	✓	

Semester Hours:	3 hours per week
Lecture/Tutorial/Laboratory Mix:	Lecture (2); Tutorial (1); Laboratory (0)

4. Assessment Tasks/Activities

Assessment Tasks / Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: 50%						
Assignment	✓				10%	
Wind tunnel experiments	✓		✓	✓	10%	
Design project using Hong Kong wind code		✓			20%	
Lab report	✓		✓	✓	10%	
Examination: 50% (duration: 3 hour(s))						
Examination					50%	
* The weightings should add up to 100%.					100%	

To pass a course, a student must obtain minimum marks of 30% in both coursework and examination components, and an overall mark of at least 40%

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)
Assignment	Ability to complete the experiments	High	Significant	Basic	Not even reaching marginal levels
Wind tunnel experiments	Ability to complete the design project	High	Significant	Basic	Not even reaching marginal levels
Design project using Hong Kong wind code	Ability to analyze the test data and discuss the results	High	Significant	Basic	Not even reaching marginal levels
Lab report	Ability to answer the exam questions	High	Significant	Basic	Not even reaching marginal levels
Examination	Ability to solve the 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)
Assignment	Ability to complete the experiments	High	Significant	Moderate	Basic	Low
Wind tunnel experiments	Ability to complete the design project	High	Significant	Moderate	Basic	Low
Design project using Hong Kong wind code	Ability to analyze the test data and discuss the results	High	Significant	Moderate	Basic	Low
Lab report	Ability to answer the exam questions	High	Significant	Moderate	Basic	Low
Examination	Ability to solve the problems	High	Significant	Moderate	Basic	Low

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

1. Keyword Syllabus

Wind storm, wind damage, atmospheric boundary layer, wind turbulence, bluff-body aerodynamics, wind loading codes, wind effects on tall buildings and structures, experimental methods of determining wind effects, effective static loading distributions, applications of computational fluid dynamics (CFD) to determine wind effects, comparison with earthquake loading.

2. Reading List

2.1 Compulsory Readings

1.	Nil

2.2 Additional Readings

1.	Choi, E. C. C. (1983). Wind Loading in Hong Kong: Commentary on the Code of Practice on Wind Effects Hong Kong-1983, Hong Kong Institution of Engineers, Hong Kong.
2.	Chopra, A.K. (1995). Dynamics of Structures, Prentice Hal.
3.	Clough, R. W. and Penzien, J. (1993). Dynamics of Structures, 2nd Edition, McGraw-Hill, Inc. New York.
4.	Code of Practice on Wind Effects, Hong Kong-2004.
5.	Holmes, J. D. (2001). Wind Loading of Structures, Spon Press, London.
6.	Jeary, A. P. (1997). Designer's Guide to the Dynamic Response of Structures. E & FN Spon.
7.	Simiu, E. and Scanlan, R. H. (1996). Wind Effects on Structures: Fundamentals and Applications to Design. John Wiley & Sons, Inc.
8.	Tedesco, J. W., Mcdougal, W. G. and Ross, C. A. (1999). Structural Dynamics Theory and Application. Addison Wesley Longman, Inc. California.