City University of Hong Kong

Information on a Course

offered by Department of Architecture and Civil Engineering
with effect from Semester A in 2014 / 2015

Part I

Course Title: Wind Engineering
Course Code: CA8009
Course Duration: 1 Semester
(Course Duration: 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
Prerequisites: Nil
Precursor: Nil
Equivalent Courses: BC8009 Wind Engineering
Exclusive Courses: Nil

Part II

1. Course Aims:

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):

Upon successful completion of this course, students should be able to:

<table>
<thead>
<tr>
<th>No.</th>
<th>CILOs</th>
<th>Weighting (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>apply fundamental principles of wind engineering theory to determine wind effects on civil engineering structures;</td>
<td>---</td>
</tr>
<tr>
<td>2.</td>
<td>apply wind loading codes for structural design;</td>
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<tr>
<td>3.</td>
<td>apply experimental methods for determining wind effects on buildings and structures;</td>
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<tr>
<td>4.</td>
<td>discover and analyze structural responses under wind action.</td>
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3. Teaching and Learning Activities (TLAs):

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

<table>
<thead>
<tr>
<th>CILO No.</th>
<th>TLAs</th>
<th>Total Hours (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CILO 1</td>
<td>● Lecture and Tutorials: general characteristics of wind actions and associated damages including wind storm, wind damage, atmospheric boundary layer, wind turbulence, bluff-body aerodynamics.</td>
<td>12</td>
</tr>
<tr>
<td>CILO 2</td>
<td>● Lecture and Tutorials: 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).</td>
<td>6</td>
</tr>
<tr>
<td>CILO 3</td>
<td>● Lecture and Tutorials: experimental methods of determining wind effects (wind tunnel tests and full-scale measurements).</td>
<td>6</td>
</tr>
<tr>
<td>CILO 4</td>
<td>● Lecture and Tutorials: determination of structural responses under wind action (effective static loading distributions, structural dynamic analysis and applications of computational fluid dynamics technique).</td>
<td>15</td>
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</tbody>
</table>

4. Assessment Tasks/Activities:

**Coursework:** 50%  
**Examination:** 50% (Examination duration = 3 hours)

<table>
<thead>
<tr>
<th>CILO No.</th>
<th>Type of assessment tasks/activities</th>
<th>Weighting (if applicable)</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| CILO 1   | ● Assignment 1: 4 questions.  
            ● Examination: 2 questions.                                                                                                                                                                                                       | ---                       | • Nil   |
| CILO 2   | ● Design project using Hong Kong wind code.                                                                                                                                                                                        | ---                       | • Nil   |
| CILO 3   | ● Wind tunnel experiments.  
            ● Submit lab report.                                                                                                                                                                                                               | ---                       | • Nil   |
| CILO 4   | ● Assignment 2: 4 questions with attentions to the documentation of discovery made during study.  
            ● Examination: 2 questions.                                                                                                                                                                                                       | ---                       | • Nil   |

5. Grading of Student Achievement:

**Grading Pattern:** Standard
Part III

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.

Recommended Reading:

- **Texts:**

- **Online Resources:**
  1. Nil