Form 2B

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:	Structural Dynamics and Applications
Course Code:	CA5010
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:	P5
Medium of Instruction:	English
Prerequisites:	Nil
Precursor:	Nil
Equivalent Courses:	BC5010 Structural Dynamics and Applications
Exclusive Courses:	Nil

Part II

Course Aims:

This course aims at equipping students with knowledge in structural dynamics, stability and vibration control with a balanced scope on fundamentals, research and applications. Basic topics include single-degree-of-freedom (SDOF) systems, multi-degree-of-freedom (MDOF) systems and continuous systems. It also includes advanced topics such as structural stability, random vibrations, damping in structures, vibration control, theory and dynamics of plates, wind and earthquake engineering.

Course Intended Learning Outcomes (CILOs):

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

No.	CILOs	Weighting (if applicable)
1.	establish governing equations for linear-elastic structural dynamics problems with common structural elements;	---
2.	apply effectively analytical and numerical techniques for analyzing dynamic response of SDOF and MDOF linear-elastic structures under different characteristic types of loading;	---
3.	identify vibration problems and apply structural dynmaics concepts to its mitigation;	---
4.	apply probability theory to analysis of linear-elastic vibration of structures subjected to stochastic loads;	---
5.	perform vibration testing of structures using common techniques;	---
6.	apply structural dynamics to basic assessment of structural response due to wind and earthquake loads.	---

Teaching and Learning Activities (TLAs):

(Indicative of likely activities and tasks designed to facilitate students' achievement of the CILOs. Final details will be provided to students in their first week of attendance in this course)

Semester Hours: 3 hours per week

Lecture/Tutorial/Laboratory Mix: Lecture (2); Tutorial (1); Laboratory (0)

CILO No.	TLAs	Total Hours (if applicable)
CILO 1	• Distributed in lectures, tutorials and assignments	9
CILO 2	• Lectures, tutorials and assignments on SDOF and MDOF systems; wind and earthquake engineering	9
CILO 3	• Distributed in lectures, tutorials and assignments	9
CILO 4	• Lectures, tutorials and assignments	3
CILO 5	• Lectures, tutorials and laboratory assignments	3
CILO 6	• Lectures, tutorials and assignments on wind and earthquake engineering	6

Assessment Tasks/Activities:

(Indicative of likely activities and tasks designed to assess how well the students achieve the CILOs. Final details will be provided to students in their first week of attendance in this course)

Coursework: 50%

Examination: 50% (Examination duration = 2 hours)

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%.

CILO No.	Type of assessment tasks/activities	Weighting (if applicable)	Remarks
CILO 1	• Assignments, exam questions	---	• required in almost all activities
CILO 2	• Assignments, exam questions	---	• required in 70% of activities
CILO 3	• Assignments, exam questions	---	• required in 20% of activities
CILO 4	• Assignments, exam questions	---	• required in 30% of activities
CILO 5	• Assignments, exam questions, laboratory assignments	---	• required in 10% of

					activities
CILO 6	•	Assignments, exam questions	---	•	required in 20% of activities

Grading of Student Achievement:

Part III

Keyword Syllabus:

Single-degree-of-freedom (SDOF) systems: free vibration, harmonic loading, periodic loading, general loading. Multi-degree-of-freedom systems (MDOF): natural frequencies and modeshapes, modal analysis, time-stepping schemes. Distributed-parameter systems: governing PDE, eigenvalue problem. Stationary stochastic processes, random vibration of structures; wind engineering; earthquake engineering; structural vibration testing.

Recommended Reading:

- **Texts:**
    1. Clough RW and Penzien J (1993), Dynamics of Structures (Second Edition), ISBN 0-07-11394-7, McGraw-Hill.
    2. Simiu E and Scanlan R (1986). Wind Effects on Structures (2nd Edition), ISBN 0-471-86613-X, Wiley-Interscience.
- **Online Resources:**
    1. Nil