

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:	Modelling and Computational Techniques for Built Environment
Course Code:	CA8018D
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:	D8
Medium of Instruction:	English
Prerequisites:	Nil
Precursor:	Nil
Equivalent Courses:	BC8018D Modelling and Computational Techniques for Built Environment
Exclusive Courses:	Nil

Part II

1. Course Aims:

The course provides the knowledge about the theories and computer implementations of the modeling and computational techniques. It allows students to appreciate the application of computational techniques to model problems in built environment and the use of commercial software packages.

2. Course Intended Learning Outcomes (CILOs):

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

No.	CILOs	Weighting (if applicable)
1.	Understand and apply the modeling techniques and computer software packages to solve problems related to engineering researches;	---
2.	Discover and explain the properties of different modeling techniques;	---
3.	Explore the significance and limitations of empirical approach, and the use of simulation models for engineering research problems.	---

3. Teaching and Learning Activities (TLAs):

Semester Hours: hours per week

Lecture/Tutorial/Laboratory Mix: Lecture (Mix); Tutorial (Mix); Laboratory (Mix)
39 contact hours

CILO No.	TLAs	Total Hours (if applicable)
CILO 1	Lectures/ Seminar/ Tutorials: finite element method, finite difference method, finite volume method	20
CILO 2	Lectures/ Seminar/Tutorials: Artificial Neural Network (ANN), fuzzy logic, system dynamics	10
CILO 3	Lecture/ Seminar/ Tutorials: numerical optimization algorithm	9

4. Assessment Tasks/Activities:

Coursework: 100%

Examination: 0%

Students must attain the minimum pass grade for each and every assignment in order to pass the course as a whole.

CILO No.	Type of assessment tasks/activities	Weighting (if applicable)	Remarks
CILO 1	Seminar: students to present a comparison of the various computational and modeling techniques.	---	Nil
CILO 2	- Project: Students to complete a project to demonstrate how a selected computational and modeling technique to solve an analytical problem in engineering researches. - Presentation: Students to present the details of the technique adopted for the project.	---	Nil
CILO 3	Summary: Students to provide a summary to critically comment on the techniques presented by other students.	---	Nil

5. Grading of Student Achievement:

Grading Pattern:

Standard

Part III

Keyword Syllabus:

Finite element method, finite difference method, finite volume method, numerical optimization algorithm, system dynamics, Artificial Neural Network (ANN), fuzzy logic.

Recommended Reading:

- **Texts:**
 1. Reddy, J.N. (2005) An Introduction to the Finite Element Method, third edition
 2. Stasa, F.L. (1995) Applied finite element analysis for engineers
 3. Epton, J. (1994) Expert System and Optimisation, Aldershot, Hants, England, Avebury Technical.
 4. Harvey, R.L., (1994) Neural Network Principles, Englewood Cliffs, Prentice Hall.
 5. Stauffer, D. (1993) Computer Simulation and Computer Algebra: Lectures for Beginners, 3rd Edition, Berlin, Springer-Verlag.
 6. Coyle R.G. (1996) System Dynamics Modeling: A Practical Approach, Chapman & Hall, London.
 - **Online Resources:**
 1. Nil
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