

**City University of Hong Kong
Course Syllabus**

**offered by Department of Architecture and Civil Engineering
with effect from Semester A 2022/23**

Part I Course Overview

Course Title:	Advanced Topics in Computational Design
Course Code:	CA6701
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:	P6
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: <i>(Course Code and Title)</i>	Nil
Precursors: <i>(Course Code and Title)</i>	Nil
Equivalent Courses: <i>(Course Code and Title)</i>	Nil
Exclusive Courses: <i>(Course Code and Title)</i>	Nil

Part II Course Details

1. Abstract

This course aims to provide students with advanced knowledge of computational design in architecture. In this course, students are expected to examine computational and parametric design by using programming language. Surveying theoretical, methodological and technical knowledge of computational and parametric design, in particular, this course organization focuses on implementing advanced technology of scripting and programming for creating a new form-creating in architecture. Students are expected to innovatively and creatively propose new, advanced methods of architectural design by establishing their own design logic. The course emphasizes the student's ability to formulate special study areas in computational design in architecture and conduct case studies or special studies of the subject matter.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	identify theoretical, methodological and technical foundation of computation design and programming language		✓	✓	
2.	examine computational design and its application			✓	
3.	create innovative forms by using parametric design, scripting, and programming			✓	✓
4.	propose new, advanced design logics of form-creating in architecture		✓		✓
		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)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.				Hours / week (if applicable)
		1	2	3	4	
Lecture	On topics related to computational design in Architecture	✓	✓	✓		
Laboratory	In-class activities on computational design			✓	✓	

Semester Hours:	3 hours per week
Lecture/Tutorial/Laboratory Mix:	Lecture (Mix); Tutorial (-); Laboratory (Mix)
	3 hrs per week including lectures and laboratory sessions

4. Assessment Tasks/Activities

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks / Activities	CILO No.				Weighting	Remarks
	1	2	3	4		
Continuous Assessment: 100%						
Assignments	✓	✓	✓	✓	100%	
Examination: 0%						
					100%	

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following 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)
Assignments	ABILITY to UNDERSTAND, ANALYZE, and DISCUSS topics related to computational design in architecture and design; CREATE innovative forms by using parametric design, scripting, and programming; CREATE new, advanced design logics of form-creating in architecture.	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)
Assignments	ABILITY to UNDERSTAND, ANALYZE, and DISCUSS topics related to computational design in architecture and design; CREATE innovative forms by using parametric design, scripting, and programming; CREATE new, advanced design logics of form-creating in architecture.	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

(An indication of the key topics of the course.)

Script, programming, Processing, visual programming, parametric design, Software such as Python, Grasshopper, Rhino, Dynamo, or Revit.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil
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2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Reas, C. & McWilliams, C. (2010) Form+Code in Design, Art and Architecture. New York: Princeton Architectural Press.
2.	Lars Spuybroek, L. (2004) NOX: Machining Architecture. New York, N.Y.: Thames and Hudson.
3.	Burry, M. (2001) Scripting Cultures: architectural design and programming. London: Wiley.
4.	Meredith, M. et al (eds.) (2008) From Control to Design: Parametric/Algorithmic Architecture. Barcelona: Actar.
5.	Weinstock, M. (2010) The Architecture of Emergence. London, Wiley.