

**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:	Applied HVAC Engineering
Course Code:	CA6606
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>	BC6606 Advanced HVAC Engineering
Exclusive Courses: <i>(Course Code and Title)</i>	Nil

Part II Course Details

1. Abstract

This course aims to study different sub-systems and major components of HVAC systems, to discuss energy conservation and management, to review the intelligent control in HVAC systems, to discuss indoor air quality, air flow pattern and thermal comfort.

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.	correlate relate the principles in indoor air quality (IAQ) and thermal comfort to room air distribution;		✓	✓	
2.	equip the techniques in the IAQ exposure assessment;		✓		
3.	discover the indoor aerosols and bioaerosols, and the migration system.			✓	✓
4.	develop numerical approach to solve engineering problems in built and environment.			✓	✓
		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	
Lectures	On topics related to heating, ventilation and air conditioning	✓	✓	✓	✓	
Tutorials	In class discussions and activities on problems related to lecture themes	✓	✓	✓	✓	

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

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: 50%						
Project	✓	✓	✓	✓	15%	
Assignment(s)	✓	✓	✓	✓	15%	
Quiz	✓	✓	✓	✓	20%	
Examination: 50% (duration: 2 hour(s))						
Examination					50%	
					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

(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)
Project	CAPACITY to EXPLORE, INVESTIGATE, and ORGANIZE knowledge and ideas in an independent fashion in topics pertaining to heating, ventilation and air conditioning	High	Significant	Basic	Not even reaching marginal levels
Assignment(s)	ABILITY to APPLY theories and knowledge to topics related to heating, ventilation and air conditioning	High	Significant	Basic	Not even reaching marginal levels
Quiz	ABILITY to UNDERSTAND theories and knowledge to topics related to heating, ventilation and air conditioning	High	Significant	Basic	Not even reaching marginal levels
Examination	ABILITY to UNDERSTAND and APPLY theories and knowledge to topics related to heating, ventilation and air conditioning	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)/ Pass (P) on P/F basis	Failure (F)
Project	CAPACITY to EXPLORE, INVESTIGATE, and ORGANIZE knowledge and ideas in an independent fashion in topics pertaining to heating, ventilation and air conditioning	High	Significant	Moderate	Basic	Not even reaching marginal levels
Assignment(s)	ABILITY to APPLY theories and knowledge to topics related to heating, ventilation and air conditioning	High	Significant	Moderate	Basic	Not even reaching marginal levels
Quiz	ABILITY to UNDERSTAND theories and knowledge to topics related to heating, ventilation and air conditioning	High	Significant	Moderate	Basic	Not even reaching marginal levels
Examination	ABILITY to UNDERSTAND and APPLY theories and knowledge to topics related to heating, ventilation and air conditioning	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.)

air distribution, indoor air quality, and exposure assessment; indoor aerosols and bioaerosols; thermal comfort; HVAC system, built and environment.

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.	Gassmann, O. & Meixner, H., 2001. Sensors in Intelligent Buildings,. Wiley-VCH, Weinheim, New York. (TH6012 .S46 2001)
2.	Underwood, C.P., 1999. HVAC Control Systems, Modelling, Analysis and Design,. E&FN Spon, London. (TH7222 .U53 1999)
3.	American Society of Heating Refrigerating & Air-conditioning Engineers(ASHRAE), (latest edition), ASHRAE Handbook - Refrigeration. ASHRAE, Atlanta, GA.
4.	American Society of Heating Refrigerating & Air-conditioning Engineers(ASHRAE), (latest edition), ASHRAE Handbook - HVAC Applications. ASHRAE, Atlanta, GA. (TH7225 .A15)
5.	American Society of Heating Refrigerating & Air-conditioning Engineers(ASHRAE), (latest edition), ASHRAE Handbook - HVAC Systems and Equipment. ASHRAE, Atlanta, GA. (TH7005 .A827)
6.	American Society of Heating Refrigerating & Air-conditioning Engineers(ASHRAE), (latest edition), ASHRAE Handbook - Fundamentals. ASHRAE, Atlanta, GA. (TH7011 .A825)
7.	American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), 2007. ASHRAE. [online] Available at [Accessed 20 March 2012].
8.	The Chartered Institution of Building Services Engineering (CIBSE), 2012. CIBSE. [online] Available at:< http://www.cibse.org >[Accessed 20 March 2012].
9.	The Hong Kong Institution of Engineers, 2012. The Hong Kong Institution of Engineers. [online] Available at: [Accessed 20 March 2012].
10.	The Government of the Hong Kong Special Administrative Region, 2008. Electrical and Mechanical Services Department. [online] Available at: < http://www.emsd.gov.hk > [Accessed 20 March 2012].
11.	The Government of the Hong Kong Special Administrative Region, 2005. Environmental Protection Department. [online] Available at: [Accessed 20 March 2012].