

**City University of Hong Kong  
Course Syllabus**

**offered by Department of Architecture and Civil Engineering  
with effect from Semester A 2023/24**

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**Part I Course Overview**

<b>Course Title:</b>	Sensing and Data Analytics for Smart Buildings
<b>Course Code:</b>	CA5564
<b>Course Duration:</b>	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.)
<b>Credit Units:</b>	3
<b>Level:</b>	P5
<b>Medium of Instruction:</b>	English
<b>Medium of Assessment:</b>	English
<b>Prerequisites:</b> <i>(Course Code and Title)</i>	Nil
<b>Precursors:</b> <i>(Course Code and Title)</i>	Nil
<b>Equivalent Courses:</b> <i>(Course Code and Title)</i>	Nil
<b>Exclusive Courses:</b> <i>(Course Code and Title)</i>	Nil

## Part II Course Details

### 1. Abstract

The course provides knowledge on the fundamentals of sensing technologies and data analytics for smart buildings. The course covers topics related the sensors, sensing technologies, the internet of things, data analytics, machine learning, etc. It prepares the students with sufficient fundamental technological background for the implementation of modern electronics and information technologies.

### 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.	Introduce the fundamental of sensing and sensing network technologies in smart buildings			✓	
2.	Introduce the data analytics in the smart buildings			✓	
3.	Understand the principles and theoretical background of sensing and data analytics theory		✓		
		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	
Lectures; seminars	Introduce the fundamentals of sensing and data analytics in the smart building	✓	✓	✓	2
Tutorials; site visits	Explore and discuss the current application of sensing and data analytics in practices through tutorials and site visits	✓	✓	✓	1

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		
Continuous Assessment: 50%					
Mid-term test	✓	✓	✓	25%	
Assignment	✓	✓	✓	25%	
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)
Mid-term test	1. ABILITY to RECOGNIZE and EXPLAIN the key concepts, mechanisms, and technologies of the sensing and data analytics	High	Significant	Basic	Not even reaching marginal levels
Assignment	1. CAPACITY to INQUIRE and ANALYSE the potential application of the sensing technologies and data analytics 2. ABILITY to ARTICULATE and EXPLAIN the rational, substantiated, and original discussion of relevant knowledge	High	Significant	Basic	Not even reaching marginal levels
Examination	1. ABILITY to RECOGNIZE and EXPLAIN the key concepts, mechanisms, and technologies of the sensing and data analytics	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)
Mid-term test	1. ABILITY to RECOGNIZE and EXPLAIN the key concepts, mechanisms, and technologies of the sensing and data analytics	High	Significant	Moderate	Basic	Not even reaching marginal levels
Assignment	1. CAPACITY to INQUIRE and ANALYSE the potential application of the sensing technologies and data analytics 2. ABILITY to ARTICULATE and EXPLAIN the rational, substantiated, and original discussion of relevant knowledge	High	Significant	Moderate	Basic	Not even reaching marginal levels
Examination	1. ABILITY to RECOGNIZE and EXPLAIN the key concepts, mechanisms, and technologies of the sensing and data analytics	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.)*

Sensing technologies, sensor technologies, data analytics, big data, data processing, internet of things.

**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.	Nil
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