

CA5248: INDOOR ENVIRONMENTAL QUALITY

Effective Term

Semester B 2024/25

Part I Course Overview

Course Title

Indoor Environmental Quality

Subject Code

CA - Civil and Architectural Engineering

Course Number

5248

Academic Unit

Architecture and Civil Engineering (CA)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

The course provides students with an overview of the factors affecting the indoor environment concerning air quality, thermal comfort, lighting, and acoustics and an understanding of the impact of indoor environmental quality on building performance.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if DEC-A1 DEC-A2 DEC-A3 app.)			
1	identify the building systems and elements that affect the indoor environmental performance and the parameters that describe the indoor environmental performance		x		
2	understand the role of human factors in indoor environmental performance		x		
3	study with competence in the total indoor environmental quality concerning building performance			x	
4	understand the management of the indoor environment in high-performance buildings		x		

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 real-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.

Learning and Teaching Activities (LTAs)

LTAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures; seminars	Introduce the essential concepts of interaction between humans and the indoor environment, indoor air quality assessment and enhancement, thermal comfort, lighting, and acoustics, and understanding of rating of indoor environmental performance in the engineering practice and development	1, 2, 3, 4	2

2	Tutorials; site visits	Explore and discuss the contemporary trends, mechanisms, and concerns of construction projects and the built environment through hands-on exercises, case studies, or site visits.	1, 2, 3, 4	1
---	------------------------	--	------------	---

Additional Information for LTAs

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

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Mid-term test	1, 2, 3, 4	25	
2	Assignment	1, 2, 3	25	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

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%

Assessment Rubrics (AR)

Assessment Task

Mid-term test (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

1. ABILITY to RECOGNIZE and EXPLAIN the key concepts, factors, mechanisms, and concerns of the indoor environmental quality

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Assignment (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

1. CAPACITY to INQUIRE and ANALYSE the issues and relevant information and references for given building elements, systems, scenarios, and context.
2. ABILITY to PRODUCE and ARTICULATE rational, substantiated, and original discussion and/or suggestion

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

1. ABILITY to EXPLAIN and DISCUSS the key concepts, mechanisms, and concerns of the building elements and systems for indoor environmental quality

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Mid-term test (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

1. ABILITY to RECOGNIZE and EXPLAIN the key concepts, factors, mechanisms, and concerns of the indoor environmental quality

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Assignment (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

1. CAPACITY to INQUIRE and ANALYSE the issues and relevant information and references for given building elements, systems, scenarios, and context.

2. ABILITY to PRODUCE and ARTICULATE rational, substantiated, and original discussion and/or suggestion

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

1. ABILITY to EXPLAIN and DISCUSS the key concepts, mechanisms, and concerns of the building elements and systems for indoor environmental quality

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic

Failure

(F) Not even reaching marginal levels

Part III Other Information**Keyword Syllabus**

Interaction between humans and the indoor environment. Indoor air quality assessment and enhancement. Thermal comfort. Lighting. Acoustics. Introduction to rating of indoor environmental performance.

Reading List**Compulsory Readings**

Title	
1	Nil

Additional Readings

Title	
1	John M. Reynolds. An introduction to applied and environmental geophysics. (QC808.5 .R49 2011)
2	Jiří Jaromír Klemeš. Assessing and measuring environmental impact and sustainability. (TD194.6 .A87 2015)
3	M. Mehta, J Johnson and J Rocafort (1999). Architectural Acoustics, Principles and Design. (NA2800 .M45 1999)
4	William J. Cavanaugh and Joseph A. Wilkes. Architectural acoustics: principles and practice. (NA2800 .A685 1999)
5	M. Stiller. Quality Lighting for High Performance Buildings. (TH7975.D8 S75 2012)
6	Philomena M. Bluyssen. The indoor environment handbook: how to make buildings healthy and comfortable. (TH6024 .B58 2009)
7	Liv Haselbach. The engineering guide to LEED-new construction: sustainable construction for engineers. (TH880 .H37 2008)
8	Architectural Services Department, https://www.archsd.gov.hk/en/home.html Architectural Services Department, https://www.archsd.gov.hk/en/home.html Architectural Services Department, https://www.archsd.gov.hk/en/home.html Architectural Services Department, https://www.archsd.gov.hk/en/home.html
9	Building Department, https://www.bd.gov.hk/en/index.html
10	Environmental Protection Department, https://www.epd.gov.hk/epd/english/top.html