SEE3207: INDOOR ENVIRONMENTAL QUALITY

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Indoor Environmental Quality

Subject Code
SEE - School of Energy and Environment
Course Number
3207

Academic Unit
School of Energy and Environment (E2)

College/School
School of Energy and Environment (E2)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
SEE2201 Fundamentals of Environmental Engineering

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract
This course aims to provide students with fundamental knowledge of key elements of indoor environmental quality and their impacts on occupants. The outcome is to furnish students with necessary skills to evaluate, design, and manage indoor

environments that promote occupant comfort, health, and satisfaction. Through a combination of theoretical knowledge, practical examples and case studies, students will develop a comprehensive understanding of the principles, strategies, and techniques employed to assess and enhance indoor environmental conditions. Topics include indoor air quality, ventilation, thermal comfort in buildings, acoustics, and lighting.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Develop a thorough understanding of indoor environmental quality, including air quality, thermal comfort, acoustics, and lighting, and their impacts on occupants.	20		x	
2	Identify and assess factors affecting indoor thermal, visual, acoustic comfort and air quality.	20		x	
3	Apply appropriate techniques and tools to evaluate indoor environmental parameters.	30		x	
4	Apply effective building design and select appropriate HVAC (heating, ventilation, and air conditioning) systems and strategies to improve indoor environmental quality in sustainable buildings.	30			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	Student will engage in lectures with facilitated discussion to gain key concepts and theories.	1, 2, 3, 4	
2	Tutorials	Student will engage in tutorials to discuss and apply theories and concepts on practical examples.	1, 2, 3, 4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignment Students will complete the assignments to demonstrate their ability to apply their knowledge on indoor environmental quality to analyse problems and to improve indoor environmental quality; and to discuss the importance of good indoor environmental quality.	1, 2, 3, 4	10	
2	Project Students will form groups to complete the project to demonstrate their ability to apply their knowledge on indoor environmental quality to analyse problems and to improve indoor environmental quality; and to discuss the importance of good indoor environmental quality.	1, 2, 3, 4	15	
3	Midterm Test Students will be tested to demonstrate their ability to apply their knowledge in indoor environmental quality problems.	1, 2, 3, 4	25	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

There will be one closed-book final examination. Students will be tested to demonstrate their knowledge learned throughout the courses in indoor environmental quality problems.

Examination duration: 2 hrs

Percentage of continuous assessment, examination, etc.: 50% by continuous assessment; 50% by exam

To pass a course, a student must do ALL of the following:

a. obtain at least 30% of the total marks allocated towards continuous assessment (combination of assignments, pop quizzes, term paper, lab reports and/ or quiz, if applicable);

b. obtain at least 30% of the total marks allocated towards final examination (if applicable); and
c. meet the criteria listed in the section on Assessment Rubrics.

Assessment Rubrics (AR)

Assessment Task
1. Assignment

Criterion
Ability to analyse, calculate and solve practical problems in Indoor Environmental Quality

Excellent (A+, A, A-)
Excellent analysis and problem-solving skills to demonstrate in-depth understanding of indoor environmental quality

Good (B+, B, B-)
Good analysis and problem-solving skills to demonstrate good understanding of indoor environmental quality

Fair (C+, C, C-)
Acceptable analysis and problem-solving skills to demonstrate adequate understanding of indoor environmental quality

Marginal (D)
Marginally acceptable analysis and problem-solving skills to demonstrate some understanding of indoor environmental quality

Failure (F)
Poor analysis and problem-solving skills and barely able to demonstrate an understanding of indoor environmental quality

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Assessment Task
2. Project

Criterion
Ability to analyse, calculate and solve practical problems in Indoor Environmental Quality

Excellent (A+, A, A-)
Excellent analysis and problem-solving skills to demonstrate in-depth understanding of indoor environmental quality

Good (B+, B, B-)
Good analysis and problem-solving skills to demonstrate good understanding of indoor environmental quality

Fair (C+, C, C-)
Acceptable analysis and problem-solving skills to demonstrate adequate understanding of indoor environmental quality

Marginal (D)
Marginally acceptable analysis and problem-solving skills to demonstrate some understanding of indoor environmental quality

Failure (F)
Poor analysis and problem-solving skills and barely able to demonstrate an understanding of indoor environmental quality

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Assessment Task
3. Midterm Test

Criterion
Ability to analyse, calculate and solve practical problems in Indoor Environmental Quality

Excellent (A+, A, A-)
Excellent analysis and problem-solving skills to demonstrate in-depth understanding of indoor environmental quality

Good (B+, B, B-)
Good analysis and problem-solving skills to demonstrate good understanding of indoor environmental quality

Fair (C+, C, C-)
Acceptable analysis and problem-solving skills to demonstrate adequate understanding of indoor environmental quality

Marginal (D)
Marginally acceptable analysis and problem-solving skills to demonstrate some understanding of indoor environmental quality

Failure (F)
Poor analysis and problem-solving skills and barely able to demonstrate an understanding of indoor environmental quality

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Assessment Task
4. Examination

Criterion
Ability to analyse, calculate and solve practical problems in Indoor Environmental Quality

Excellent (A+, A, A-)
Excellent analysis and problem-solving skills to demonstrate in-depth understanding of indoor environmental quality

Good (B+, B, B-)
Good analysis and problem-solving skills to demonstrate good understanding of indoor environmental quality

Fair (C+, C, C-)
Acceptable analysis and problem-solving skills to demonstrate adequate understanding of indoor environmental quality

Marginal (D)
Marginally acceptable analysis and problem-solving skills to demonstrate some understanding of indoor environmental quality

Failure (F)
Poor analysis and problem-solving skills and barely able to demonstrate an understanding of indoor environmental quality

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Part III Other Information

Keyword Syllabus
Ventilation theory and indoor air quality; Indoor air quality models; Comparison and analysis of different air conditioning and energy systems for indoor environmental quality; Thermal comfort in buildings; Lighting design; Indoor acoustic.

Reading List

Compulsory Readings

	Title
1	Indoor Air Quality: Occurrence and Health Effects of Contaminants. Fromme, Hermann.
2	Air conditioning system design. Roger Legg. Butterworth-Heinemann. TH7687.L428 2017.
3	A guide to energy management in buildings. Douglas J. Harris, 2nd edition, London, New York, 2017

Additional Readings

	Title
1	Nil