

# SEE3207: INDOOR ENVIRONMENTAL QUALITY

## New Syllabus Proposal

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### 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	Explain theories and concepts	1, 2, 3, 4	
2	Tutorials	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 coursework, examination, etc.: 50% by coursework; 50% by exam

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

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

- 2) obtain at least 30% of the total marks allocated towards final examination (if applicable); and
- 3) 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