

SEE3103: ENERGY EFFICIENCY FOR BUILDINGS

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Energy Efficiency for Buildings

Subject Code

SEE - School of Energy and Environment

Course Number

3103

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

SEE2101 Engineering Thermofluids I

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

This course aims to provide the students with the knowledge of our energy demands, major energy consumers and effective demand side management for efficient use of energy.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if DEC-A1 app.)		DEC-A2	DEC-A3
1	Analyse energy demand and predict future growth for both local and world markets.	20	x		
2	Evaluate energy efficiency of major energy consumers.	40		x	
3	Practise energy audit and demand side management to save energy, with innovative and creative solutions.	40		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/Tutorials	Students will learn effective engineering and management methods to achieve high energy efficiency. Students will also learn problem solving skills and software for energy saving.	1, 2, 3	3
2	Project	Students will apply knowledge learned and gain in-depth understanding of building energy consumption and saving.	1, 2, 3	

Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1 Assignments Students show their ability to analyse energy demand, evaluate energy efficiency of major energy consumers, conduct energy audit and apply demand side management methods to save energy for buildings.	1, 2, 3	20	-	Yes
2 Project Students demonstrate their ability to describe knowledge and innovation for building energy consumption and saving, including energy demand, energy efficiency, energy analysis and demand side management.	1, 2, 3	20	-	Yes

Continuous Assessment (%)

40

Examination (%)

60

Examination Duration (Hours)

2

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

30

Additional Information for ATs**Examination:**

Students show their ability to determine energy consumption, energy saving, energy efficiency of major building energy consumers and demand side management methods.

Examination duration: 2 hrs

Percentage of continuous assessment, examination, etc.: 40% by continuous assessment; 60% 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. Assignments

Criterion

Ability to solve practical problems related to energy efficiency

Excellent (A+, A, A-)

Excellent performance in analysing energy consumption and saving; and applying energy engineering knowledge

Good (B+, B, B-)

Good performance in analysing energy consumption and saving; and applying energy engineering knowledge

Fair (C+, C, C-)

Medium performance in analysing energy consumption and saving; and applying energy engineering knowledge

Marginal (D)

Adequate performance in analysing energy consumption and saving; and applying energy engineering knowledge

Failure (F)

Poor performance in analysing energy consumption and saving; and applying energy engineering knowledge

Assessment Task

2. Project

Criterion

Ability to do independent critical thinking

Excellent (A+, A, A-)

Excellent performance in practising innovation for energy saving

Good (B+, B, B-)

Good performance in practising innovation for energy saving

Fair (C+, C, C-)

Medium performance in practising innovation for energy saving

Marginal (D)

Adequate performance in practising innovation for energy saving

Failure (F)

Poor performance in practising innovation for energy saving

Assessment Task

3. Examination

Criterion

Ability to apply engineering knowledge and skills to solve problems related to energy efficiency

Excellent (A+, A, A-)

Excellent performance in applying energy engineering knowledge and technical skills to improve energy efficiency

Good (B+, B, B-)

Good performance in applying energy engineering knowledge and technical skills to improve energy efficiency

Fair (C+, C, C-)

Medium performance in applying energy engineering knowledge and technical skills to improve energy efficiency

Marginal (D)

Adequate performance in practising innovation for energy saving

Failure (F)

Poor performance in practising innovation for energy saving

Part III Other Information

Keyword Syllabus

Energy end-use data; Benchmark data; Demand side management; Energy audit; Energy management opportunities (EMO); Energy-saving economic analysis; Electrical power quality; Power factor; Harmonics; Energy-efficient lighting; Light-emitting diode (LED); Heating, ventilating and air conditioning (HVAC); Refrigeration; Heat pumps; Cogeneration; Heat recovery.

Reading List**Compulsory Readings**

Title	
1	Code of Practice for Energy Efficiency of Building Services Installation, Electrical and Mechanical Engineering Department, HKSAR Government, 2018.
2	Albert Thumann, Terry Niehus and William J. Younger, Handbook of Energy Audits, 9th ed., Fairmont Press, 2012.
3	Barney L. Capehart et al., Guide to Energy Management, 7th ed., Fairmont Press and CRC Press Talyor & Francis, 2012.

Additional Readings

Title	
1	2021 ASHRAE Handbook – Fundamentals, ASHRAE (IP), 2021.
2	Code of Practice for Energy Efficiency of Building Services Installation, EMSD, HKSAR Government, 2018.