SEE6115: CARBON AUDIT AND MANAGEMENT

Effective Term
Semester B 2024/25

Part I Course Overview

Course Title
Carbon Audit and Management

Subject Code
SEE - School of Energy and Environment
Course Number
6115

Academic Unit
School of Energy and Environment (E2)

College/School
School of Energy and Environment (E2)

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
SEE8115 Carbon Audit and Management

Exclusive Courses
Nil

Part II Course Details

Abstract
This course aims to provide the students with the knowledge and principles needed to carry out carbon audits in a number of sectors, to examine the impact of carbon emission to our environment, to appreciate the function of carbon audits as a

means to help business sectors and corporations in estimating their carbon footprints thereby setting objectives to manage and reduce these carbon footprints, to apply various methods/approaches of reducing energy consumption and carbon emissions, to carry out the carbon audit processes and to employ the necessary skills to undertake such audit. As energy consumption is often one of the dominating factors in carbon footprint analysis, the students will also learn energy auditing and various energy management opportunities (EMOs). The students will also learn carbon offsetting and carbon trading.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Identify the effects of carbon emissions on the environment and the challenges faced.	10	x		
2	Apply techniques of energy efficiency and conservation to manage the energy consumption and carbon emissions.	30		x	
3	Conduct economic and life cycle analysis of energy and carbon reduction measures; Review the relevant regulations relevant to energy consumptions.	10	x	x	x
4	Develop the carbon footprint calculator for relevant processes. Reflect on how organisations can offset and trade emissions.	20	x		x
5	Perform basic energy and carbon audit for a range of sectors.	30	x	x	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	Lecture	Lectures are used to describe and illustrate the basic concepts and the working principles.	1, 2, 3, 4, 5	2 hrs per wk
2	Tutorial	Tutorials are used to explain their suitable applications through practical examples, numerical exercises, real cases, class assignments and discussions.	1, 2, 3, 4, 5	1 hr per wk

3	Analysis	Students to analyse data sets and examples to demonstrate critical thinking and interpretation of energy and carbon auditing.	1, 2, 3, 4, 5	3 hrs per wk

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignments	1, 2, 3, 4, 5	20	
2	Quizzes	1, 2, 3, 5	20	
3	In-class exercises	1, 2, 3, 4, 5	20	

Continuous Assessment (%)

60

Examination (%)

40

Examination Duration (Hours)

2

Additional Information for ATs

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

In-class exercises (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to analyse, calculate and solve practical problems in carbon and energy auditing

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Low

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

Criterion
Ability to analyse, calculate and solve practical problems in carbon and energy auditing

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Low

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

Criterion
Ability to apply engineering knowledge and skills to analyse, calculate, and solve problems related to energy and carbon auditing

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Low

Assessment Task
Final exam (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Ability to analyse, calculate and solve practical problems in carbon and energy auditing

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Low

Assessment Task
In-class exercises (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Ability to analyse, calculate and solve practical problems in carbon and energy auditing

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate

Failure
(F) Low

Assessment Task
Assignments (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Ability to analyse, calculate and solve practical problems in carbon and energy auditing

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate

Failure
(F) Low

Assessment Task
Quizzes (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Ability to apply engineering knowledge and skills to analyse, calculate, and solve problems related to energy and carbon auditing

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate

Failure
(F) Low

Assessment Task
Final exam (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Ability to analyse, calculate and solve practical problems in carbon and energy auditing

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

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(B-, C+, C) Moderate

Failure
(F) Low

Part III Other Information

Keyword Syllabus
Climate change and potential challenges; Greenhouse gas emission and environmental impact; Energy management and auditing; Building energy consumption; Finance and life cycle assessments; Carbon management and auditing; Carbon audit guidelines in Hong Kong; International practice, trend and standard; Carbon footprint calculator. Carbon Offsetting and Emissions trading; Description and analysis of historical and current issues addressed by emissions trading systems; Systems for post Paris agreement; Kyoto Protocol implementation in different countries; the European Union emissions trading system.

Reading List

Compulsory Readings

	Title
1	Shelley W. W. Zhou, Carbon Management for a Sustainable Environment, 2020, Springer International Publishing

Additional Readings

	Title
1	Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings (Commercial, Residential or Institutional Purposes) in Hong Kong, Electrical and Mechanical Services Department and Environmental Protection Department, The Government of Hong Kong Special Administrative Region, 2010.
2	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Intergovernmental Penal on Climate Change, 2006.