SYE6108: ENERGY CONSERVATION AND MANAGEMENT

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Energy Conservation and Management

Subject Code
SYE - Systems Engineering
Course Number
6108

Academic Unit
Systems Engineering (SYE)

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
ADSE6108 Energy Conservation and Management (offered until 2023/24)

Exclusive Courses
Nil

Part II Course Details

Abstract

This course aims to: (1) understand the technological, social, economic and environmental factors related to the use of fossil fuels and renewable energy; (2) understand the major energy consumers in buildings, transportation and industrial processes; and (3) identify effective energy conservation and conduct energy audits and management systems.
Topics include: energy sources and environmental impact; energy in buildings; energy-efficient industrial processes; waste heat recovery; energy storage; energy auditing; energy strategies and management.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Energy source and its environmental impact	25	x	x	
2	Energy efficiency, generation, and storage	25	x	x	
3	Energy audits and management	25	x	x	
4	Energy strategies, policy, economics method and analysis	25	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 on the topics of the keyword syllabus.	1, 2, 3, 4	3 hours/week

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Individual report	1, 2, 3, 4	30	-	Yes

Continuous Assessment (%)

30

Examination (%)

70

Examination Duration (Hours)

2

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

30

Assessment Rubrics (AR)

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

Criterion
Apply the knowledge of mathematics, science and engineering to economic energy audit and analysis.

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

Criterion
Understand some of the techniques, skills, and modern trends for energy conservation and management.

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 from Semester A 2022/23 to Summer Term 2024)

Criterion
Apply the knowledge of mathematics, science and engineering to economic energy audit and analysis.

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate/Basic

Failure
(F) Not even reaching marginal levels

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

Criterion
Understand some of the techniques, skills, and modern trends for energy conservation and management.

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate/Basic

Failure
(F) Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

- Energy sources and its consumption now and then
- Environmental impact: global warming and climate change
- Energy audits and management in buildings
- Heating, ventilating, air conditioning and lighting technologies
- Energy in major appliances, electric motor system and transportation
- Industrial energy efficiency and energy management
- Waste Heat Recovery and heat Pumps
- Energy generation by low-or zero-C technologies
- Energy storage technologies
- Economics method and analysis
- Energy strategies and management

Reading List

Compulsory Readings

	Title
1	"Energy Management and Conservation Handbook," 2nd Edition, CRC press, 2016.
2	"Energy and the Environment," 4th edition, Wiley, 2022.
3	"Handbook of Energy Audits," 9th edition, River Publisher, 2012.

Additional Readings

	Title
1	NIL