City University of Hong Kong
Course Syllabus

offered by School of Energy and Environment
with effect from Semester A 2024/25

Part I Course Overview

Course Title:	**Renewable Energy Generation**
Course Code:	**SEE6128**
Course Duration:	**One semester**
Credit Units:	**3 credits**
Level:	**P6**
Medium of Instruction:	**English**
Medium of Assessment:	**English**
Prerequisites: *(Course Code and Title)*	**Nil**
Precursors: *(Course Code and Title)*	**Nil**
Equivalent Courses: *(Course Code and Title)*	**Nil**
Exclusive Courses: *(Course Code and Title)*	**Nil**

Part II Course Details

1. Abstract

This course focuses on the various energy supply systems that are crucial in modern society. The curriculum will cover the operational principles of fundamental energy generation systems, exploring their advantages and major drawbacks. Emphasis will be placed on non-conventional and renewable energy sources as vital components of sustainable development. Students will gain an understanding of the technologies that harness renewable resources to produce energy, contributing to a greener and more sustainable future.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Analyze the global supply and demand dynamics of energy resources.	10		✓	
2.	Evaluate the advantages and limitations of conventional energy generation methods.	20	✓	✓	
3.	Describe and contrast the operational principles and environmental effects of coal-fired and nuclear power plants.	20		✓	
4.	Identify various renewable energy sources and appraise emerging technologies for energy generation and storage from these sources.	50	✓	✓	✓
		100%			

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.

3. Learning and Teaching Activities (LTAs)

(LTAs designed to facilitate students' achievement of the CILOs.)

LTA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
Lecture	Explain key concepts, such as theories related to energy generation	✓	✓	✓	✓	2.0 hrs/wk
Tutorial	Solidify students' concepts with practice	✓	✓	✓	✓	0.5 hrs/wk
Project presentation	Student-led presentations on energy generation topics				✓	0.5 hrs/wk

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.				Weighting	Remarks
	1	2	3	4		
Continuous Assessment: 50%						
Assignment	✓	✓	✓	✓	15 %	
In-class test	✓	✓	✓		20 %	
Class presentation				✓	15 %	
Examination: 50% (duration: 2 hours, if applicable)						
					100%	

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.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Assignment	Ability to evaluate and analyse questions related to energy generation	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. In-class test	Ability to analyse and solve practical problems related to energy supply and power plant	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Project presentation	Ability to effectively communicate and critique energy generation systems	Delivers an outstanding presentation with a critical analysis of energy generation systems, demonstrating a high level of expertise.	Provides a well-structured presentation with clear analysis and critique of energy generation systems; shows a strong command of the topic.	Offers a basic presentation with limited analysis and critique of energy generation systems; shows a fundamental understanding with room for improvement.	The presentation lacks coherence, with little to no analysis of energy generation systems; it fails to demonstrate a satisfactory level of understanding.	Not even reaching marginal levels
4. Final Exam	Ability to analyse and solve practical problems related to energy generation	High	Significant	Moderate	Basic	Not even reaching marginal levels

Applicable to students admitted from Semester A 2022/23 to Summer Term 2024

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Assignment	Ability to evaluate and analyse questions related to energy generation	High	Significant	Moderate	Not even reaching marginal levels
2. In-class test	Ability to analyse and solve practical problems related to energy supply and power plant	High	Significant	Moderate	Not even reaching marginal levels

3. Project presentation	Ability to effectively communicate and critique energy generation systems	Delivers an outstanding presentation with a critical analysis of energy generation systems, demonstrating a high level of expertise.	Provides well-structured presentation with clear analysis and critique of energy generation systems; shows a strong command of the topic.	Offers a basic presentation with limited analysis and critique of energy generation systems; shows a fundamental understanding with room for improvement	The presentation lacks coherence, with little to no analysis of energy generation systems; it fails to demonstrate a satisfactory level of understanding.
4. Final Exam	Ability to analyse and solve practical problems related to energy generation	High	Significant	Moderate	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

Fuel availability; fossil fuels; conventional and non-conventional energy systems; biomass; combustion; steam cycle; coal-fired power plant, nuclear power plant; generator; emission control; principles of renewable energy such as solar, wind, hydro, tidal and wave; energy storage systems.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Energy Science, Principles, Technologies, and Impacts, John Andrews and Nick Jelley, Oxford University Press, 2nd edition, 2013

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Alternative Energy Systems and Applications, B. K. Hodge, John Wiley and Sons, 2010.
2.	Energy and Climate: How to achieve a successful energy transition, Alexandre Rojey, Wiley, 2009.
3.	Renewable Energy. Boyle G. Oxford University Press, 2012.
4.	Energy for a Sustainable World, Nicola Armaroli, Vincenzo Balzani, Wiley-VCH, 2011.
5.	Principles of Sustainable Energy, Frank Kreith, Jan F. Kreider, CRC Press, 2011.
6.	Nuclear Energy: what everyone needs to know, Charles D. Ferguson. Oxford University Press, 2011.
7.	Introduction to Wind Energy Systems. Basics, technology and operation. Hermann-Josef Wagner, Jyotirmay Mathur, Springer 2013.
8.	Geothermal Energy: renewable energy and the environment, William E. Glassley, CRC Press, 2010.
9.	Solar Energy Fundamentals. Robert K. McMordie, Fairmont Press, 2012.
10.	US Department of Energy - http://www.energy.gov/ Renewable Energy Association - http://www.r-e-a.net/ National Hydrogen Association - http://www.hydrogenassociation.org/ EMSD website: http://www.emsd.gov.hk