City University of Hong Kong
Course Syllabus

offered by School of Energy and Environment
with effect from Semester A 2018/19

Part I Course Overview

Course Title:	Energy: Today and Tomorrow
Course Code:	GE1308
Course Duration:	One semester
Credit Units:	3
Level:	A1, B1
Proposed Area: *(for GE courses only)*	☐ Arts and Humanities ☐ Study of Societies, Social and Business Organisations ☑ Science and Technology
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

(A 150-word description about the course)

The world energy demand continues to grow at an increasing rate, especially in the developing countries, such as China. However, available fossil fuel resources are decreasing. It is predicted that the world oil production will reach the peak in a few years. The energy crisis problems will escalate seriously then. Moreover, burning fossil fuels is the main source of greenhouse gas and air pollutants, which are detrimental to the environment. Therefore, our present fossil fuel based energy supply is indeed not sustainable.

Recently, research and development on clean energy and renewable energy are very active. New government policies, commitments and regulations are set to promote green energy. The energy industry is entering a new era of sustainability.

This course is designed to enable students to develop a broader perspective and critical understanding of the current energy issues. The students after taking the course will have the basic comprehension of the science and technologies related to energy supply and utilization. The students will understand the environmental impacts and political conflicts arising from the world's heavy reliance on fossil fuel based energy supply. The students will also be able to apply the knowledge learned to assess innovative alternative energy technologies and policies in different contexts, such as economy, environment, social and political matters. The major learning activities include lectures, tutorials, seminars, live demonstration experiments, project and field trip.

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.	Explain how power generators and power plants work	20%		✓	
2.	Assess environmental impacts arising from production of energy	20%		✓	
3.	Practise demand side management	20%			✓
4.	Appreciate clean, renewable and innovative energy technologies	20%		✓	
5.	Describe the significance of sustainability (economic, environmental & social factors) in the power industry	20%			✓
		100%			

** If weighting is assigned to CILOs, they should add up to 100%.*

 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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 self-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. Teaching and Learning Activities (TLAs)

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

TLA	Brief Description	CILO No.					Hours/week (if applicable)
		1	2	3	4	5	
Lectures	Introduction to science, engineering principles, practical systems and strategies of energy supply and demand.	✓	✓	✓	✓	✓	2
Tutorials	Practice on problem solving; questions and answers; group discussion.	✓	✓	✓	✓	✓	1
Demonstration experiments	Live demonstration experiments to illustrate how energy is converted into various useful forms and the energy conversion efficiency.	✓		✓	✓		NA
Seminars	Knowledge and experience sharing by experts in the energy industry.	✓			✓	✓	NA
Fieldwork	Visit to power plant, renewable energy plant, or other energy related facilities.	✓				✓	NA
Reading; Self-study; Project	Data and information collection; problem solving, critical and creative thinking, report writing.	✓	✓	✓	✓	✓	5

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	5		
Continuous Assessment: __100__%							
Participation: Students' involvement throughout the course	✓	✓	✓	✓	✓	10%	
Quizzes: Short written questions to assess students' knowledge and understanding in energy	✓	✓	✓	✓	✓	20%	
Assignments: Individual homework assignments on problem solving and analysis in energy sciences, policy and supply strategies.	✓	✓	✓	✓	✓	30%	
Project: Group exercise where students work together to comprehensively analyze an innovative and novel energy technology	✓	✓	✓	✓	✓	40%	
Examination: __0__% (duration: N/A hours , if applicable)							
** The weightings should add up to 100%.*						100%	

Examination duration: N/A

Percentage of coursework, examination, etc.: 100% by coursework

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.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Quizzes	Capacity for self-directed learning to understand the principles of energy supply and demand	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Assignments	Capacity for problem solving and analysis in energy sciences, policy and supply strategies	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Project	Ability to analyze innovative energy technology	High	Significant	Moderate	Basic	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.)

1. Introduction to energy sciences and energy resources
2. Fossil-fuel based power plants and nuclear power plants
3. Environmental impacts of energy use
4. Demand side management and energy for transportation
5. Renewable energy and energy storage
6. Economics and policies related to energy

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.	Anon 2008. Environment and energy. Transportation Research Board, Washington D.C.
2.	Aubrecht G.J. 2006. Energy: Physical, Environmental, and Social Impact. 3rd ed., Pearson Prentice Hall.
3.	Elliot D. 2007. Sustainable energy: opportunities and limitations. Palgrave Macmillan.
4.	Goswami Y.D., Kreith F. and Kreider J.F. 2000. Principles of Solar Engineering. 2nd ed., Taylor & Francis.
5.	Hafemeister D. 2007. Physics of societal issues: calculations on national security, environment and energy. Springer.
6.	Herring H. and Sorrell S. 2009. Energy efficiency and sustainable consumption: the rebound effect. Palgrave Macmillan.
7.	http://www.emsd.gov.hk/emsd/eng/pee/index.shtml
8.	http://www.energyinst.org.hk/
9.	http://www.hkaee.org/
10.	http://www.unep.org/themes/energy/?page=home
11.	http://www.withouthotair.com
12.	http://www.elsevier.com/wps/find/journaldescription.cws_home/269/description#description

2.2 Additional Readings

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

Nil