

**City University of Hong Kong  
Course Syllabus**

**offered by School of Energy and Environment  
with effect from Semester A 2017/18**

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**Part I Course Overview**

**Course Title:** Energy, Environment and Sustainable Development

**Course Code:** SEE5114

**Course Duration:** One semester

**Credit Units:** 3

**Level:** P5

**Medium of Instruction:** English

**Medium of Assessment:** English

**Prerequisites:**  
(Course Code and Title) None

**Precursors:**  
(Course Code and Title) None

**Equivalent Courses:**  
(Course Code and Title) SEE8114 Energy, Environment and Sustainable Development

**Exclusive Courses:**  
(Course Code and Title) Nil

## Part II Course Details

### 1. Abstract

This course aims to develop better understanding of energy and environmental issues with sustainable development. It focuses on raising the awareness of the world's connection to environmental issues, examining the principles and tools for sustainable processes and exploring the methods for reducing the environmental impact. The students will learn about fundamental concepts of sustainability and the methods to evaluate their significance. Sustainable processes in the wider economic, social and environmental contexts will be covered.

The course is designed with an emphasis on interdisciplinary reflection, systems thinking and sharing of students' own experience. The teaching/learning will be supported by video presentations, seminars, web-based resources, site visit and group discussions.

### 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.	Describe issues relevant to the emergence and ongoing development of sustainable processes in the wider economic, social and environmental contexts	20	√		√
2.	Evaluate the overall techno-economic of sustainable processes	20	√		√
3.	Identify the methodologies available for environmental impacts assessment of a process design	20	√	√	√
4.	Recognise the context of the drivers, challenges and indicators to measure social sustainability	20		√	√
5.	Describe the basic principles of green buildings and transportation. Explain the important issues and factors affecting the practices of sustainable architectural design and transportation system.	20	√	√	√
		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 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	
Lecture and tutorial	Explain key concepts, explore case studies and practical applications related to Energy, Environment and Sustainability issues	√	√	√	√	√	2 hours/week
Class work	Solidify students' concepts through video presentations, Web-based resources and in-class exercises	√	√	√	√	√	1 hour/week

### 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: <u>60</u> %							
Team project	√	√	√	√	√	30%	
Case study	√	√	√	√		10%	
In-class exercises	√	√	√	√		10%	
Oral presentation	√	√	√	√	√	10%	
Examination: <u>40</u> % (duration: 2 hours, if applicable)							
						100%	

Examination duration: 2 hrs

Percentage of coursework, examination, etc.: 60% by coursework; 40% by exam

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 in-class exercises, case study, oral presentation, 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. Team project	Ability to write a proposal for the application of Sustainable Development Fund	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Case study and In-class exercises	Ability to apply concepts and theories to sustainable design of processes in practice	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Oral presentation	Ability to communicate and relate energy and environmental issues with sustainable development	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Final exam	Ability to analyse and calculate practical problems in energy, environment and sustainability-related issues.	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.)*

- Unit operation and process flow sheet
- Techno-economic evaluation
- Life cycle assessment of sustainable chemical processes
- Social economic impact
- Social sustainability
- Land Requirement and Land-use Change
- Green Building and Transportation

#### 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.	Technology for Biobased Products Online course by Delft University of Technology (TU Delft) <a href="https://www.edx.org/course/technology-biobased-products-delftx-tbp01x#.VJ6LVrAQ">https://www.edx.org/course/technology-biobased-products-delftx-tbp01x#.VJ6LVrAQ</a>
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##### 2.2 Additional Readings

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

The following are reference books and documents useful for the students in this course. Additional reference sources on the course topics will be provided over the course. Students may also find other information and Internet resources on the course website in Canvas.

1.	Study on Sustainable Development for the 21 <sup>st</sup> Century (SUSDEV21) <a href="http://www.pland.gov.hk/pland_en/p_study/comp_s/susdev/ex_summary/final_eng/ch5.htm">http://www.pland.gov.hk/pland_en/p_study/comp_s/susdev/ex_summary/final_eng/ch5.htm</a>
2.	Perry RJ and Green JH. (2007) Perry's chemical engineer's handbook, 8 <sup>th</sup> edition, McGraw-Hill, New York.
3.	Sinnott, R.K., Towler, G. 2009. <i>Chemical Engineering Design 5th ed.</i> Elsevier/Butterworth-Heinemann.
4.	Peters MS, Timmerhaus KD and West RE. (2003) Plant design and economics for chemical engineers. 5th edition, McGraw Hill, New York.