

City University of Hong Kong
Course Syllabus

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

Part I Course Overview

Course Title: Energy and Environmental Economics

Course Code: SEE3002

Course Duration: 1 semester

Credit Units: 3 credits

Level: B3

Arts and Humanities

Proposed Area: Study of Societies, Social and Business Organisations

(for GE courses only)

Science and Technology

Medium of Instruction: English

Medium of Assessment: English

Prerequisites: Nil
(Course Code and Title)

Precursors: Nil
(Course Code and Title)

Equivalent Courses: Nil
(Course Code and Title)

Exclusive Courses: Nil
(Course Code and Title)

Part II Course Details

1. Abstract

This course aims to initiate students into the fields of energy and environmental economics and the economics of collectively shared resources. Students will become conversant with the language and methods of energy and environmental economics and be able to create applications of these methods to real-world problems. They will learn and use terminology such as externalities, public goods, common property resources, marginal cost pricing, cost-benefit analysis, and many other terms and the practical applications of these concepts. They will understand the economic principles and practices behind the use of market instruments to conserve energy resources and to discover the price of, and control environmental impacts, including taxation, feed-in tariffs, and other features of current and future economics-based methodologies, analyses, laws, standards, and regulations, and they will be able to innovate solutions to environmental problems by applying these principles.

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.	Define and identify externalities associated with various types of market transactions and describe and explain ways of discovering their shadow prices or values and internalizing them	15%	✓		
2.	Define and identify examples of public goods, common property resources, and other types of collectively shared resources and describe market failure modes associated with each and means of remedying them	15%	✓		
3.	Design ways of charging for and paying for energy and natural resources such that their use will be economically optimal and sustainable and will also produce adequate returns on investment for their providers	15%		✓	
4	Describe and apply innovative techniques of non-market valuation to estimate the demand for environmental quality or the cost of environmental degradation	10%	✓		
5	Design and critically evaluate from an economic perspective public policies associated with energy and the environment	10%		✓	
6	Apply and critically evaluate cost-benefit analyses of energy and environmental policies and projects	10%		✓	
7	Analyse and evaluate energy projects using internal rate of return on investment, net present value, and payback period methodologies	10%	✓		
8	Understand and be able to join intelligently in debates as an aid in the discovery of innovative applications of economics to energy and the environment	15%		✓	
		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	6	7	8	
Classroom lectures	Learning in the presence of the teacher	✓	✓	✓	✓	✓	✓	✓	✓	
Videos and other visual aids	Slide and videos are used to support the course content	✓	✓	✓	✓	✓	✓	✓	✓	
In-class student debates of controversial topics	The teacher will regularly ask questions	✓	✓	✓	✓	✓	✓	✓	✓	
Individual and group projects for class presentation	Projects will be made by the student that require to use the content of the course	✓	✓	✓	✓	✓	✓	✓	✓	
Homework problems for discussion and solution	Homework and problems are used to apply the content of the course and to train the students.	✓	✓	✓	✓	✓	✓	✓	✓	
In-class midterm and final examinations	Students should also learn from the exercises and the questions they have to do during the exam.	✓	✓	✓	✓	✓	✓	✓	✓	

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	6	7	8		
Continuous Assessment: <u>60</u> %										
Homework problems	✓	✓	✓	✓	✓	✓	✓	✓	20%	
In-class debates and student projects	✓	✓	✓	✓	✓	✓	✓	✓	20%	
Mid-term test	✓	✓	✓	✓	✓	✓	✓	✓	20%	
Examination: <u>40</u> % (duration: 2 hrs , if applicable)										
									100%	

* The weightings should add up to 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 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. Homework	Ability to analyse and solve problems related to energy and environmental economics.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Mid-term test	Ability to analyse and solve problems related to energy and environmental economics.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Examination	Ability to analyse and solve problems related to energy and environmental economics.	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.)

- (a) Introduction to economics; introduction to microeconomics (3 Lectures). Keywords: invisible hand, incentives, marginality, supply/demand curves, market equilibrium, optimum
- (b) Externalities, market failure, Pigovian fees, and the efficient level of pollution (2 Lectures). Keywords: externalities, internalizing externalities, market failure, polluter pays principle, Coase theorem, taxes
- (c) Public goods, private goods, rival goods, excludable goods, and common property resources (2 Lectures). Keywords: rival and excludable goods, public and private goods, common property resources, tragedy of the commons
- (d) Cost-benefit analysis; project evaluation (1 Lecture). Keywords: cost-benefit ratio, present value, private/social discount rate, payback period
- (e) Energy economics (2 Lectures). Keywords: marginal cost / average cost pricing, time of day pricing, congestion pricing, baseload / peak load, feed-in tariff

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.	Kolstad C.D. : <i>Environmental Economics</i> , Oxford University Press, 2010
2.	Perman R., Ma Y. and McGillvray J. : <i>Natural Resources and Environmental Economics</i> , Pearson Education 3rd ed., 2011
3.	Tietenberg T. and Lewis L. : <i>Environmental Economics and Policy</i> , Pearson Education, 6 th ed., 2010

2.2 Additional Readings

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

1.	Varian H. : <i>Intermediate Microeconomics</i> , W.W. Norton 9 th ed., 2014
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