

**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: Climate Change and Extreme Weather

Course Code: GE1301

Course Duration: One semester

Credit Units: 3

Level: B1

Arts and Humanities

Study of Societies, Social and Business Organisations

Proposed Area:
(for GE courses only) 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)

This course covers issues such as weather and climate in our lives, our changing climate history, sea level rise and our future, ozone hole vs global warming, El Niño events and disastrous climate, tropical cyclones, and response to climate change.

This course intends to enable students to contribute to the debate on global environmental change and societal adaptation strategies, to understand the latest innovative development in the discipline, to connect scientific world with daily life and to help students become better informed citizens and decision makers.

This course aims to provide students with an understanding of contemporary climate issues, to broaden students' knowledge about the myth and facts of global warming, and to raise his/her awareness of extreme weather in a changing world.

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.	Understand the earth system and greenhouse effect	15%	✓		
2.	Explain the difference between weather and climate	10%	✓		
3.	Understand ENSO and severe weather events	20%	✓		
4.	Describe sea level rise, tsunami and earthquake hazards	15%	✓		
5.	Understand mechanisms responsible for climate change: past, present, and future, and the latest innovative development in the discipline	20%	✓		
6.	Apply the acquired knowledge to explain the possible causes of global warming, its effects and solutions	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	6	
Lectures	Introduction of basic concepts, ideas, and arguments.	✓	✓	✓	✓	✓	✓	1.5
Tutorials	Group discussion/presentation.	✓	✓	✓	✓			1.5
Projects	Team work/ Problem solving, critical and creative thinking, report writing.					✓	✓	2
Seminars	Knowledge and experience sharing by experts from HKO.			✓				
Fieldwork	Visit to HKO, EPD or airport.					✓	✓	

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		
Continuous Assessment: <u>100</u> %								
Participation: Students' involvement throughout the course.	✓	✓	✓	✓	✓	✓	10%	
In-class assignments: Short written questions to assess students' knowledge and understanding in climate change and severe weather.	✓	✓	✓				20%	
Individual homework: Students are required to write a report on extremes events of their choice.				✓			30%	
Group discussions/presentation.		✓	✓	✓	✓		40%	
Examination: <u>0</u> % (duration: N/A hours, if applicable)								
* The weightings should add up to 100%.							100%	

Scheduled activities: 1.5 hrs lecture + 1.5 hrs tutorial including team projects (hands-on experiments), group presentations and group assessment exercises. Group discussion is a good TLA as students need to do prior research before the activity. Furthermore, if students are formed into teams, they can gain experience with teamwork. The maximum class size is 60.

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. In-class assignments	Ability to analyse questions related to the earth system and greenhouse effect	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Individual homework	Ability to analyse questions related to atmospheric circulation and extreme weather events	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Group discussions/presentation	Ability to analyse questions related to climate change and climate adaptation	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. Weather and severe weather in our lives
The weather around us, Cyclones and frontal systems, Severe weather: thunderstorms, tornadoes, and hurricanes
2. Our changing climate history
Climate through the ages, Six historic periods, Global climate regions, Extreme climate environments, Records of climate change, Natural causes of climate change
3. Sea level rise, tsunami and earthquake hazards
Glaciers, Sea level rise, Plate tectonics, Seismic waves and earthquake detection, Earthquake hazards, Earthquake safety
4. El Niño events and disastrous climate
Ocean currents and circulation, El Niño-Southern Oscillation (ENSO), Impacts of ENSO. Severe hazards: droughts, floods, snow storms, heat waves.
5. Global Change and Response to climate change
Alternative climates, Greenhouse gases and global change, Carbon footprint for a sustainable living: carbon cycle, carbon footprint, human effects, personal responsibility for global warming.

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.	
2.	
3.	
...	

2.2 Additional Readings

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

1.	The Good Earth. Introduction to Earth Science. McConnell Steer Knight Owens. The McGraw-Hill Companies
2.	The Greenhouse Effect, Diana Falloon (NSW, 1993)
3.	Meteorology Today: An Introduction of Weather, Climate, and the Environment, C. Donald Ahrens (Brooks/Cole, 6th edition, 2000)
4.	http://www.co2science.org/subject/e/ensoew.php
5.	Understanding Weather and Climate, E Aguado and J E Burt (Prentice Hall, 2001)
6.	Weather: Eyewitness Companion (Dorling Kindersley, 2008)
7.	Extreme weather and climate, C. Donald Ahrens and Perry Samson (Brooks/Cole, 2011)
8.	Meteorology: understanding the atmosphere, Steven A. Ackerman and John A. Knox (Jones & Bartlett Learning, 2014)
9.	http://weather.cityu.edu.hk/
10.	http://www.cityu.edu.hk/gcacic/index.htm
11.	http://www.hko.gov.hk/education/edu01met_e.htm
12.	http://www.metoffice.gov.uk/learning/learn-about-the-weather
13.	http://www.metoffice.gov.uk/climate-guide

A. Please specify the Gateway Education Programme Intended Learning Outcomes (PILOs) that the course is aligned to and relate them to the CILOs stated in Part II, Section 2 of this form:

GE PILO	Please indicate which CILO(s) is/are related to this PILO, if any (can be more than one CILOs in each PILO)
PILO 1: Demonstrate the capacity for self-directed learning	CILOs 1-5: Students will demonstrate their self-directed learning ability via self study, assignments and projects.
PILO 2: Explain the basic methodologies and techniques of inquiry of the arts and humanities, social sciences, business, and science and technology	CILOs 1,2,3,4: Students will understand the science of various energy technologies related to these CILOs.
PILO 3: Demonstrate critical thinking skills	CILO 5: Students will make critical judgments in climate change.
PILO 4: Interpret information and numerical data	
PILO 5: Produce structured, well-organised and fluent text	CILOs 1-5: Students will practise structured, well-organized writing and documentation in assignments and projects.
PILO 6: Demonstrate effective oral communication skills	
PILO 7: Demonstrate an ability to work effectively in a team	CILOs 1-5: Students will develop teamwork ability in group project.
PILO 8: Recognise important characteristics of their own culture(s) and at least one other culture, and their impact on global issues	
PILO 9: Value ethical and socially responsible actions	CILO 5: Students will appreciate the significance of social responsibility for climate change.
PILO 10: Demonstrate the attitude and/or ability to accomplish discovery and/or innovation	CILOs 1-5: Students will demonstrate the attitude and ability to accomplish discovery via self study, assignments and projects.

GE course leaders should cover the mandatory PILOs for the GE area (Area 1: Arts and Humanities; Area 2: Study of Societies, Social and Business Organisations; Area 3: Science and Technology) for which they have classified their course; for quality assurance purposes, they are advised to carefully consider if it is beneficial to claim any coverage of additional PILOs. General advice would be to restrict PILOs to only the essential ones. (Please refer to the curricular mapping of GE programme: http://www.cityu.edu.hk/edge/ge/faculty/curricular_mapping.htm.)

B. Please select an assessment task for collecting evidence of student achievement for quality assurance purposes. Please retain at least one sample of student achievement across a period of three years.

Selected Assessment Task	Related CILO(s)	Related GE PILO(s)
Hands on experiments: analysis of each student's carbon footprint. An opportunity for students to clarify significant notions through their own efforts, an exercise for students to be aware that there is an alternative to reduce the carbon footprint at home and school. Students are required to work out well argued and defensible positions of their own through a process of collaboration.	CILO 5 CILO 6	PILO 3 PILO 7 PILO 9 PILO 10