GE1301: CLIMATE CHANGE AND EXTREME WEATHER

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Climate Change and Extreme Weather

Subject Code
GE - Gateway Education
Course Number
1301

Academic Unit
School of Energy and Environment (E2)

College/School
School of Energy and Environment (E2)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

GE Area (Primary)
Area 3 - Science and Technology

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

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 adaption 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.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the basic components of the Earth system and greenhouse effect	20	x		
2	Explain natural climate variability and anthropogenic climate change	30	x	x	
3	Describe different types of extreme weather events	30	x	x	
4	Demonstrate critical thinking skills in global climate change, its effects, and possible solutions	20		x	x

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.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Students will engage in lectures to gain key concepts, ideas, and arguments.	1, 2, 3, 4	3 hrs/wk
2	Group Project	Students will form a small group of 3–5, and identify, analyse, and discuss their findings on climate change-related issues and their possible solution in the form of group report writing and presentation.	2, 3, 4	3 hrs/wk for 2–3 weeks

3	Field Trip	Depending on availability, students may have the opportunity to visit the Hong Kong Observatory (HKO), Environmental Protection Department (EPD), or the airport. If a field trip is organized on a weekend, students can choose to participate voluntarily.	4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	In-class Quiz	1, 2, 3, 4	30	
2	Midterm Assignment (essay types)	1, 2, 3	30	
3	Group Project (written report and group presentation)	1, 2, 3, 4	40	

Continuous Assessment (%)

100

Examination (%)

0

Examination Duration (Hours)

N/A

Additional Information for ATs

Examination duration: N/A

Percentage of continuous assessment, examination, etc.: 100% by continuous assessment

To pass a course, a student must do ALL of the following:

1) obtain at least 30% of the total marks allocated towards continuous assessment (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.

Assessment Rubrics (AR)

Assessment Task

1. In-class Quiz

Criterion

ABILITY to RESOLVE problems from various key concepts and principles.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
2. Midterm Assignment

Criterion
ABILITY to RESOLVE problems from various key concepts and principles.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
3. Group Project

Criterion
ABILITY to EXPLAIN in DETAIL and with ACCURACY for climate change problems.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

1. Weather and climate
Weather and climate, climate variability and climate change

2. Components of the Earth System
Geosphere, Cryosphere, Biosphere, Hydrosphere, Atmosphere

3. Climate change
Past to future climate change, anthropogenic climate change, urbanization, ocean acidification

4. Climate variability
Natural climate forcings, climate feedback, El Niño-Southern Oscillation (ENSO), Pacific Decadal Oscillation (PDO), Arctic Oscillation (AO)

5. Extreme weather events
Tropical cyclones, extreme temperatures events (heat waves, cold surges), extreme precipitation events (floods, droughts)

6. Climate policy and Intergovernmental Panel on Climate Change (IPCC)

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	The Good Earth. Introduction to Earth Science. McConnell Steer Knight Owens. The McGraw-Hill Companies
2	Understanding Weather and Climate, E Aguado and J E Burt (Prentice Hall, 2001)
3	Extreme weather and climate, C. Donald Ahrens and Perry Samson (Brooks/Cole, 2011)
4	https://science.nasa.gov/climate-change/
5	https://www.hko.gov.hk/en/education/edu03course.htm
6	https://www.metoffice.gov.uk/weather/climate

Annex (for GE courses only)

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:

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

1, 2, 3

PILO 2: Explain the basic methodologies and techniques of inquiry of the arts and humanities, social sciences, business, and science and technology

1, 2, 3

PILO 3: Demonstrate critical thinking skills

4

PILO 4: Interpret information and numerical data

1, 2, 3

PILO 5: Produce structured, well-organised and fluent text

1, 2, 3, 4

PILO 6: Demonstrate effective oral communication skills

1, 2, 3, 4

PILO 7: Demonstrate an ability to work effectively in a team

2, 3, 4

PILO 8: Recognise important characteristics of their own culture(s) and at least one other culture, and their impact on global issues

1, 2

PILO 9: Value ethical and socially responsible actions

4

PILO 10: Demonstrate the attitude and/or ability to accomplish discovery and/or innovation

2, 3, 4

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

Group report:
Group project is a great opportunity for students to demonstrate their skills in self-understanding, critical thinking, interpretation of data, well-organized text writing, oral communications, teamwork, and demonstrate their ability to accomplish discovery and/or innovation. Students are required to work out well argued and defensible positions of their own through a process of collaboration.

Related CILO(s): CILOs 1-4
Related GE PILO(s): PILO 1, PILO 3, PILO 4, PILO 5, PILO 6, PILO 7, PILO 10