SEE5202: CLIMATE CHANGE: SCIENCE, ADAPTATION AND MITIGATION

Effective Term
Semester B 2024/25

Part I Course Overview

Course Title
Climate Change: Science, Adaptation and Mitigation

Subject Code
SEE - School of Energy and Environment

Course Number
5202

Academic Unit
School of Energy and Environment (E2)

College/School
School of Energy and Environment (E2)

Course Duration
One Semester

Credit Units
3

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

It is widely recognised that climate change is one of the most important problems of our time. This course will first cover the basic physical science related to different components of the earth system that are related to various aspects of weather and climate. These concepts are then applied to explain the science of climate change. The tools in studying the past and current weather and climate as well as in weather and prediction and in future climate projection will also be introduced. The second part of the course is to make use of the knowledge from the first part on the science of climate change to understand different types of extreme weather and their impacts on society, and to discuss various adaptation measures to tackle these impacts. The last part will be on mitigation strategies to slow down anthropogenic climate change.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the key features of the various components of the earth system and their key physical processes, and the physical mechanisms behind climate and climate change	40	x	x	
2	Describe the tools for studying past, present and future climate and explain the limitations in predicting future climate	5	x		
3	Explain the basics of various extreme weather events and their impacts on society under climate change	20	x	x	
4	Describe and explain various adaptation measures to tackle the impacts of climate change	30	x	x	x
5	Describe mitigation strategies to reduce anthropogenic climate change	5	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 /tutorials		1, 2, 3, 4, 5	3 hours/week
2	Term paper presentation		4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Homework and quizzes	1, 2, 3	25	
2	Midterm	1, 2, 3	25	
3	Term paper	4, 5	50	

Continuous Assessment (%)

100

Additional Information for ATs

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.

Assessment Rubrics (AR)

Assessment Task

Homework (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to apply the concepts learned in class to solve real-world 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

Assessment Task

Quizzes (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to explain key concepts

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
Term paper (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Ability to apply lecture material to explain solutions of real-world issues and 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

Assessment Task
Homework (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Ability to apply the concepts learned in class to solve real-world problems

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Quizzes (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to explain key concepts

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Term paper (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Ability to apply lecture material to explain solutions of real-world issues and problems

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Basic

Failure
(F) Not even reaching marginal levels

Part III Other Information

Keyword Syllabus
CILO1
i) Basics of the various components of the earth system and their key physical processes
ii) Basic physical mechanisms explaining natural and anthropogenic climate change
CILO2
i) Tools for studying the past, current and future weather and climate and their limitations
CILO3
i) The concepts of risk, hazard, vulnerability, resilience and impacts
ii) Basics of certain types of extreme weather events and their impacts on society under climate change
CILO4
i) Principles of adaptation and adaptation measures and their effectiveness
CILO5
i) Mitigation strategies to reduce anthropogenic climate change

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	T.F. Stocker et al. (eds.), 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press. [Available from http://ipcc.ch/report/ar5/wg1/]
2	C.B. Field et al. (eds.), 2014: Climate Change 2014: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change Cambridge University Press. [Available from http://ipcc.ch/report/ar5/wg2/]
3	O. Edenhofer et al. (eds.), 2014: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press. [Available from http://ipcc.ch/report/ar5/wg3/]
4	C.D. Ahrens, 2013: Meteorology today: an introduction to weather, climate, and the environment, Brooks/Cole.
5	R. Henson, 2011: The Rough Guide to Climate Change Rough Guides.