



Course Descriptor

ENEN581 CLIMATE CHANGE

Proposed Academic Year	2020/2021	Last Reviewed Academic Year	2019/2020
Course Code	ENEN581	Course Title	Climate Change
Credit hours	3	Level of study	Forth
College / Centre	College of Engineering	Department	Environmental Engineering
Co-requisites		Pre-requisites	CVEN361

1. COURSE OUTLINE

This course introduces the science of climate works and change; what factors cause climate to change across different time scales and how those factors interact; how climate has changed in the past; and the possible consequences of climate change for our planet. The course explores evidence for changes in ocean temperature, sea level and acidity due to global warming. Finally, the course looks at the connection between human activity and the current warming trend and considers some of the potential social, economic and environmental consequences of climate change

2. AIMS

[This introductory course will give students an integrated overview of the science of climate change and an analysis of the implications of this change for patterns of daily life in their own circumstance and around the world.

3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS

Learning Outcomes (Definitive)	Teaching and Learning methods (Indicative)	Assessment (Indicative)
Upon successful completion of this course, students will be able to:		
1. Demonstrate a solid understanding of the climate system.	Lectures	Assignments and in-class tests
2. Evaluate the various factors that shape climate.	Lectures	Assignments and in-class tests
3. Describe how past climates contribute to our current understanding of climate change.	Lectures	Assignments and in-class tests
4. Explain the consequences, risks, and uncertainties of climate change.	Lectures, video projections	Assignments and in-class tests

4. ASSESSMENT WEIGHTING

Assessment	Percentage of final mark (%)
Assignments	20%
Midterms two	40%
Final	40%



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Mid-term Examination, two	40%
Final Examination	40%
TOTAL	100%

5. ACHIEVING A PASS

Students will achieve 4 credit hours for this course by passing **ALL** of the course assessments and achieving a **minimum overall score of 50%**

NB *Ensure that ALL learning outcomes are taken into account

LECTURE TOPIC	TIME (HOURS)
Introduction to global climate	3
Radiation heat transfer and the greenhouse effect.	3
Scattering and absorption by gases, clouds, and aerosols.	3
Feedbacks due to water vapour, clouds, ice, and vegetation.	3
Chemistry of greenhouse gases.	3
Chemistry of greenhouse gases (cont)	3
Climates of the past. Ice ages.	3
The global-warming debate.	3
The global-warming effects on agriculture	3
Economic and political aspects of climate change.	3
Methods for climate change mitigation.	3
Case studies of climate change mitigation solutions	3
Air quality legislation.	3
International conventions on climate change	3
Course review	3
TOTAL HOURS	45



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Plus RECOMMENDED INDEPENDENT STUDY HOURS	
TOTAL COURSE HOURS	45

7. RECOMMENDED READING

Core text/s:

Hartmann, D. (1994). *Global Physical Climatology*, Vol 56, International Geophysics, Academic Press.

Library + online resources:

<https://www.globalchange.gov/browse/educators/wildlife-wildlands-toolkit>

<https://open.umn.edu/opentextbooks/textbooks/bending-the-curve-climate-change-solutions>

<https://www.oercommons.org/courses/mitigating-climate-change/view>