

GD305-15 Challenges of Climate Change

20/21

Department

Global Sustainable Development

Level

Undergraduate Level 3

Module leader

Jessica Savage

Credit value

15

Module duration

10 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

The changes to global climate being brought about by human activity present one of the greatest challenges to confront humanity, and are likely to have a profound effect over the working lives of today's students. Understanding them requires a comprehensive approach spanning multiple disciplines. The aim of this module is to equip students to begin to do this, by providing a grounding in the central scientific, economic and political issues surrounding climate change.

[Module web page](#)

Module aims

To provide undergraduates from a wide range of backgrounds with an up to date view of the central challenges that climate change poses. This will be delivered from experts across different disciplines, each describing challenges in their field at a level suitable for all. Following the course we aim to equip students to address these challenges. The students should be able to:

- a) Understand the major issues that climate change raises across a range of disciplines (science, economics, politics, engineering etc).
- b) Explain the approaches to these challenges that are currently at play, or proposed, and the

problems they create.

- c) Appreciate the role of uncertainty in climate change, how this may be folded into actions, and how it is implemented across different fields (where it often has slightly different meanings).
- d) Critically examine material relating to climate and climate change, and assess its reliability.
- e) Be able to meaningfully discuss the nature of climate change with individuals from a wide range of backgrounds.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

This is an interdisciplinary course, which will address the major scientific, philosophical, social, economic, political and technological challenges arising from climate change (real or imagined, manmade or not). It will cover the central issues of the field with expert lecturers, who will speak at a level accessible to non-experts in the field, with the only requirements being a grasp of Science and Mathematics to GCSE level. In particular the course will address the following issues.

Week One - Introduction

Week Two - Physical basis of Climate Change

Week Three - Climate modelling and its discontents

Week Four - Environmental impacts of Climate Change

Week Five - The Economics of Climate Change

Week Six - Uncertainty of Climate Change

Mitigation Scenarios

Week Seven - Climate Change and the Energy Industry

Week Eight - Migration and Climate Change

Week Nine - Climate Justice and Climate Politics

Week Ten - Christmas Lecture

Learning outcomes

By the end of the module, students should be able to:

- Understand the key underlying physical processes that drive climate.
- Apply this basic knowledge to determine how changes in the atmospheric composition might impact global temperatures in idealised systems.
- Recognize the complexity of climate in practice, and the sources of uncertainty in both measuring past climate, and in future projections.
- Identify the possible impacts of climate change on environmental, human and economic scales.
- Critique the plausible alternative paths to carbon free living, and be able to evaluate their relative costs and benefits.
- Appreciate the fundamental difficulties in arriving at an agreement via collective bargaining.
- Understand the suggested mechanisms for either adapting to, or mitigating against, climate change, and those which are (or have been) used.
- Appreciate the scope and limitations of market influences on individual and collective decisions affecting climate change, and the prospects for designing new economic instruments.

- Critically assess the various economic methods for evaluating climate change.

Research element

Students are expected to undertake independent research as part of this module

Interdisciplinary

This is an interdisciplinary course, which will address the major scientific, philosophical, social, economic, political and technological challenges arising from climate change (real or imagined, manmade or not).

International

This is embedded into the principal themes of the module which are:

The underlying physical processes that govern global climate, the evidence for human-induced warming, predictions for the future, and assessment of mitigation strategy.

Ecological, economic and social consequences of climate change.

Difficulties in the way of reaching a political consensus for action to mitigate climate change; political strategies and technological mechanisms to overcome them, and to adapt to future changes.

Students taking this module will gain a solid understanding of the major challenges that climate change presents, together with knowledge enabling them to participate actively and constructively in the efforts to meet them.

Subject specific skills

Subject knowledge and understanding

1. Understand the key underlying physical processes that drive climate.
2. Apply this basic knowledge to determine how changes in the atmospheric composition might impact global temperatures in idealised systems.
3. Recognize the complexity of climate in practice, and the sources of uncertainty in both measuring past climate, and in future projections.
4. Identify the possible impacts of climate change on environmental, human and economic scales.
5. Critique the plausible alternative paths to carbon free living, and be able to evaluate their relative costs and benefits.
6. Appreciate the fundamental difficulties in arriving at an agreement via collective bargaining.
7. Understand the suggested mechanisms for either adapting to, or mitigating against, climate change, and those which are (or have been) used.
8. Appreciate the scope and limitations of market influences on individual and collective decisions affecting climate change, and the prospects for designing new economic instruments.
9. Critically assess the various economic methods for evaluating climate change.

Transferable skills

Written communication skills
Oral communication skills
Working with others
Problem solving
Information technology
Numeracy
Research across various disciplines
Peer review

Study

Study time

| Type | Required |
|---------------|------------------------------|
| Lectures | 10 sessions of 2 hours (13%) |
| Seminars | 9 sessions of 2 hours (12%) |
| Private study | 112 hours (75%) |
| Total | 150 hours |

Private study description

Research and reading in preparation for the seminars

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group A

| | Weighting | Study time |
|------------------------------|-----------|------------|
| Group Presentation | 30% | |
| 15 Minute Group Presentation | | |

| | Weighting | Study time |
|------------------------|------------------|-------------------|
| Essay | 50% | |
| Multitple choice quiz | 20% | |
| Multi-choice questions | | |

Feedback on assessment

The multiple choice questions will automatically release both a mark, and a detailed analysis of the questions as soon as the deadline is passed. Similarly, written feedback on submitted work will be given through Tabula within the University guideline periods.

Availability

Courses

This module is Optional for:

- Year 1 of TMAA-G1PE Master of Advanced Study in Mathematical Sciences
- Year 1 of TMAA-G1P0 Postgraduate Taught Mathematics
- Year 1 of TMAA-G1PC Postgraduate Taught Mathematics (Diploma plus MSc)
- UECA-3 Undergraduate Economics 3 Year Variants
 - Year 3 of L100 Economics
 - Year 3 of L100 Economics
 - Year 3 of L100 Economics
 - Year 3 of L116 Economics and Industrial Organization
 - Year 3 of L116 Economics and Industrial Organization
- Year 2 of UIPA-L8A1 Undergraduate Global Sustainable Development