

HR920-10 Climate Change

21/22

Department

Life Sciences

Level

Taught Postgraduate Level

Module leader

Stephen Jackson

Credit value

10

Module duration

2 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

Climate Change is widely agreed to be the most important environmental driver of economic and societal change for the 21st century. Almost all areas of policy and planning, commerce and production will take place in the context of how they affect or are affected by climate change outcomes.

Module aims

The purpose of this module is to provide a broad introduction to the science of climate change, its origins and consequences. This module presents the evidence for past and recent climate change. It will introduce the most important greenhouse gases, explain their origins and action. It will consider how predictions of future changes are made; introduce the scenarios that lie beneath them and how these are translated at different spatial and temporal scales. This will lead on to potential impacts, particularly with regard to ecosystems, agriculture and food security. The module will conclude by considering mitigation and adaptation to climate change, particularly in agricultural systems.

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.

1. Basic principles of climate change, evidence, examples of changes (phenology), origin and role of IPCC, approaches and methodologies of climate impact studies (2 lectures).
- 2) Carbon dioxide; Its role in climate change, evidence for increases, mechanism of action, origins and fate of carbon dioxide in the atmosphere, role of biotic and abiotic factors.
- 3) Methane & other GHGs; Their importance as greenhouse gases, Global cooling, sulphur, aerosols. Factors that affect warming by absorbing or reflecting radiation. Origins, mechanisms.
- 4) Ozone & UV-B. Origins of ozone, impact at stratospheric and tropospheric level. International agreements and impact. Ozone holes and UV. Ozone, crops and health.
- 5) Future Climates 2050 & 2080, global and regional. IPCC reports, future scenarios, timescales. Impact projections, global patterns of change. UKCIP projections.
- 6) Impacts on Sea and coastline. Components of ocean climate; temperature, salinity, circulation, heat exchange. Acidification of the oceans, sea levels, storms and coastal erosion marine ecosystems.
- 7) Impacts on Agriculture and Food production. How do plants respond to increased temperature and carbon dioxide. How do changes at the individual plant level translate into crop performance. How will these interact with other changes such as water availability and ozone levels.
- 8) Agriculture and Food Production in the UK. What will be the main drivers for change in the future? The consequences of climate change for where and how crops are grown in the UK. The impact of extreme weather. The potential for new crops.
- 9). Politics of Climate Change. Legal and Global Political issues, International Agreements.
- 10) What are the implications of Climate Change for Food Security. What parts of the world's food production system will be most affected by climate change. What will be the limiting factors. How will the drive for renewables affect food production?
- 11) Mitigation of and adaptation to climate change.

Learning outcomes

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

- Critically evaluate the evidence for climate change
- Demonstrate knowledge of future scenarios and climate predictions
- Know the potential impacts of climate change
- Understand how agricultural systems may adapt to climate change
- Evaluate risks to food security associated with climate change

Indicative reading list

Bloom, AJ (2010) Global Climate Change: convergence of disciplines. Sinauer Associates Inc.

Houghton J (2004). Global Warming: The Complete Briefing. Cambridge University Press

Lovejoy, TE & Hannah L (2005). Climate Change and Biodiversity. Yale University Press

Morison JIL & Morecroft MD (2006). Plant Growth and Climate Change. Blackwell

Dessler AE & Parson EA (2010). The Science and Politics of Global Climate Change: a guide to the debate. Cambridge University Press.

Houghton (2009) Global warming: the complete briefing. Cambridge University Press.

Timothy Cadman (2013) Climate change and global policy regimes [electronic resource] : Towards institutional legitimacy. Palgrave Macmillan.

Frank Oldfield (2005) Environmental change : key issues and alternative perspectives. Cambridge University Press.

Mark Maslin (2009) Global warming : a very short introduction. Oxford University Press.

Mohan Munasinghe, Rob Swart (2005) Primer on climate change and sustainable development : facts, policy analysis, and applications. Cambridge University Press.

[View reading list on Talis Aspire](#)

Subject specific skills

Understand how Agricultural systems may adapt to climate change

Evaluate risks to food security associated with climate change

Transferable skills

Critical evaluation

Study

Study time

Type	Required
Lectures	11 sessions of 1 hour (11%)
Seminars	2 sessions of 4 hours (8%)
Tutorials	1 session of 2 hours (2%)
Practical classes	2 sessions of 3 hours (6%)
Private study	48 hours (48%)
Assessment	25 hours (25%)
Total	100 hours

Private study description

Independent research

Costs

No further costs have been identified for this module.

Assessment

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

Assessment group A3

	Weighting	Study time	Eligible for self-certification
Assessment component			
Data handling and report	40%	10 hours	Yes (extension)
Reassessment component is the same			

Assessment component			
Assessed presentation	60%	15 hours	No
Reassessment component is the same			

Feedback on assessment

Written feedback on presentation and essay.

Availability

Courses

This module is Core for:

- Year 1 of THRA-D4A1 Postgraduate Taught Environmental Bioscience in a Changing Climate
- THRA-D4A3 Postgraduate Taught Food Security
 - Year 1 of D4A3 Food Security
 - Year 1 of D4A3 Food Security
- Year 1 of THRA-D4A2 Postgraduate Taught Sustainable Crop Production: Agronomy for the 21st Century

This module is Optional for:

- Year 1 of ULFA-C1A1 Undergraduate Biological Sciences (MBio)