

Climate Change
Geography
GY 313
5 ECTS Credits

Climate Change GY313ss

The module will mainly be delivered through lectures with one field trip focusing on public knowledge and perceptions of climate change.

The learning outcomes will be as follows:

Students will gain a detailed understanding of how the field of climate science originated.

Students will gain knowledge of how climate data is gathered, how the methods have changed over time, how the data is analysed and how historical climate scientists interpret this data to find trends in the climate.

Students will have an opportunity to engage with a data rescue project and see first hand how historical data is gathered and rescued.

Students will also explore public perceptions of climate change and learn how to gather data to answer key questions related to climate adaptation.

They will gain experience in the field. Students will be introduced to the concepts surrounding climate models and the many problems scientists face when modelling future climate.

Students will also have a chance to explore the many debates within climate change and put their own debating skills to the test.

Module structure:

Class 1, Historical climatology and origins of the field (Will include an introduction to citizen science and data rescue): this class will explore the key discoveries which helped to develop the field of climate science. It will show students how climate scientists collect data and why historical climatology is important. It will also teach students about data rescue and allow them to engage in projects.

Class 2, Evidence for Climate change: this class will explore the types of data that scientists use to evaluate trends in the climate. It will show students what evidence exists to confirm that the climate is changing

Class 3, How does the Climate change? This class will focus on the physical processes that drive climate change.

Class 4, Perceptions of Climate Change and adaptation:

This class will explore how people's perceptions of climate change form and how these perceptions influence adaptation to future climate change.

Class 5, Public knowledge and perceptions of climate change: this class will deal with the methods used to understand perceptions of climate change and how climate information can be communicate to the public. This will class will tie in with the theme of the field trip.

Class 6, What is dangerous about climate change? This class will explore the dangers of climate change such as heatwaves, floods and possible impacts on ecosystems and society if the world adopts a business as usual approach.

Class 7, How do we know about future climate change?

This class will explore climate models and how we live with uncertainty and create robust apatation strategies.

Class 8, The IPCC process and climate debates:

This class will introduce students to the process used by the intergovernmental panel on climate change for producing their climate change reports. It will also explore some of the debates and political issues around the topic

Assessment:

100% continuous assessment (60% essay/project, 30% field report, 10% in class contribution and additional exercises).

Field trip:

Students will be brought to the Cool Planet Experience climate exhibition in Powerscourt estate County Wicklow. This is an interactive exhibition that will show students how climate change information can be communicated to the public.

Students will also have the opportunity to design and implement a survey on the grounds to investigate public perceptions and knowledge of climate change before and after engaging with the exhibition.

The collected data will then be used to show students data analysis techniques and for class discussions.

This field trip will show students some of the methods used for collecting data. It will tie in with class 4 and 5 on public knowledge and perceptions of climate change and it will show students possible ways of effectively communicating climate information.

Additional exercises include:

- 1) Citizen science and data rescue project: students will get first hand experience engaging with a citizen science project cyclone center and data rescue of old weather records.
- 2) Presentation: students will get the opportunity to improve their presentation skills by delivering a short presentation related to their in-class data rescue work.
- 3) Climate services project: students will be presented with various climate change scenarios (eg: what impacts will farmers face from climate change in the future) and be asked to put their knowledge to the test and produce an action plan to inform the public of future risks.
- 4) Climate debates: students will have the opportunity to put their knowledge to the test and debate about various issues related to climate change.
- 5) Create surveys: students will gain skills in creating and implementing surveys to capture public perceptions of climate change.

Field report: following the field trip students will evaluate the data obtained and produce an 800 word report detailing what they discovered.

Project: students will produce a 2,500 word project related to one aspect of the course that they are interested in. This project could involve data rescue and it's importance or deal with communication of climate science to the public.

Reading list:

Wilby, R.L. *Climate Change in Practice*.

IPCC summary for policy makers.

Kjellström, Erik. "Recent and future signatures of climate change in Europe." *AMBIO: A Journal of the Human Environment* 33.4 (2004): 193-199.

Noone, Simon, et al. "A 250-year drought catalogue for the island of Ireland (1765–2015)." *International Journal of Climatology* 37 (2017): 239-254.

Murphy, Conor, et al. "Irish droughts in newspaper archives: rediscovering forgotten hazards?." *Weather* 72.6 (2017): 151-155.

Wilby, Robert L., and Suraje Dessai. "Robust adaptation to climate change." *Weather* 65.7 (2010): 180-185.

Poumadere, Marc, et al. "The 2003 heat wave in France: dangerous climate change here and now." *Risk Analysis: an International Journal* 25.6 (2005): 1483-1494.

Murphy, Conor, et al. "Adapting to climate change in shifting landscapes of belief." *Climatic change* 134.1-2 (2016): 101-114.

Cunsolo, Ashlee, and Neville R. Ellis. "Ecological grief as a mental health response to climate change-related loss." *Nature Climate Change* 8.4 (2018): 275.

Clarke, Darren, Conor Murphy, and Irene Lorenzoni. "Place attachment, disruption and transformative adaptation." *Journal of Environmental Psychology* 55 (2018): 81-89

Adger, W. Neil, et al. "Are there social limits to adaptation to climate change?." *Climatic change* 93.3-4 (2009): 335-354.

Lenton, Timothy M., et al. "Tipping elements in the Earth's climate system." *Proceedings of the national Academy of Sciences* 105.6 (2008): 1786-1793.

Smith, Joel B., et al. "Assessing dangerous climate change through an update of the Intergovernmental Panel on Climate Change (IPCC) "reasons for concern". " *Proceedings of the national Academy of Sciences* 106.11 (2009): 4133-4137.

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