

PAB4103

Climate Change, Plants & Agriculture

How does Earth's climate change over time, and how can we track those changes?

How have climate and atmosphere led to the evolution of plant diversity?

What are the effects of ongoing environmental and climate changes on crops, agriculture and ecosystems?

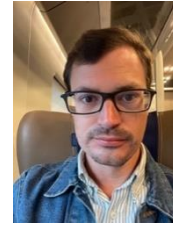
What strategies can we use to understand and mitigate climate impacts on plants and agriculture?

Module description: This module will outline how changes in the Earth's climate and atmospheric composition influence the life and evolution of plants, including species of relevance in agriculture and forestry.

Theories considering the likely triggers for major innovations in plant development and the evolution and responses of plants to major environmental changes, including those caused by changes to the carbon cycle will also be examined, including case studies of past mass extinction events.

The module will then consider how plants respond to ongoing climatic changes. The module develops student understanding of plant and crop responses in current-day and future ecosystems and agriculture, including in Ireland and internationally; the roles of plants in ecosystem restoration and carbon storage are also considered.

You will make a class presentation based on a journal club to develop their skills in interpreting primary research papers, and prepare a write-up of a computer-based climate modelling workshop to hone their academic writing in preparation for their final year thesis.



Coordinator and Lecturer

Dr. Peter McKeown

Email:

PAB.AgSci@universityofgalway.ie

Students' Testimonials

"The Continuous Assessment elements meant that there was a deeper understanding throughout the module."

I liked how integrated it is to the real world. very applicable course with a well-balanced assessment."

"I liked the links to real-life issues that are currently happening making it more interesting."

"I often left lectures feeling empowered and encouraged to work in a job that will hopefully help with the current climate issues."

Learning Outcomes:

By the successful completion of the module, you will be able to:

- **LO1** Explain the links between plant evolution and changing atmospheric composition
- **LO2** Describe the principal impacts of climate change on crops and livestock, including in the context of Irish agricultural production systems.
- **LO3** Relate current issues in plant biology to ongoing climate challenges to agriculture, ecosystems and sustainable development, including as described in the Sustainable Development Goals.
- **LO4** Explain the importance of maintaining and enhancing carbon stores, including in wetlands, forests and agricultural soils and develop strategies to achieve this.
- **LO5** Critically evaluate the concept of Climate-Smart Agriculture and its application to sustainable agri-food systems, in Ireland and internationally.
- **LO6** Evaluate data from a research paper relevant to the module and present interpretations.
- **LO7** Perform a plant-climate modelling exercise and write up the results as a short, referenced article

Module Assessment:

Presentation of a paper in a journal club (30%);
Climate-plant physiology modelling class (30%);
End of Semester exam (40% – two essays);

Examinable material includes lectures, textbook, and PDFs on Canvas.

We will make use of the geological timescale during the course; you will be provided with a copy of this during the exam
