

GEOG 3105 – A: Climate and Atmospheric Change

Instructor	Adam Kirkwood, PhD
Term	Winter 2025
Course Delivery	In-person
Email Address	adamkirkwood@cunet.carleton.ca

COURSE DESCRIPTION

Although the Earth's climate has varied appreciably in the past due to natural forcing, human activities are increasingly contributing to climate warming. Since the Earth's climate system is interlinked with many biophysical processes on the planet, climate change has important repercussions. This course will examine climate and atmospheric change from a scientific perspective. We will look at proxy evidence of past climate change followed by historical and instrumental records, which reveal recent and current climate variability, and then models, which enable the projection of future climates under certain scenarios. Students will gain an understanding of the relative importance of climate forcing factors and feedbacks as well as an appreciation of the uncertainties and outstanding debates in climate science. The focus of this course is how and why our climate changes from an interdisciplinary scientific perspective. However, we will take some time to examine some implications and impacts of climate change as well as the interface between science, the media, the public and policy.

EVALUATION

	Grade	Due Date
Lab 1 – Climate change and AI	10%	January 16, 2025
Lab 2 – Science writing	10%	January 30, 2025
Lab 3 – Recent climate	10%	February 13, 2025
Lab 4 – Future climate	15%	March 15, 2025
Lab 5 – Tipping points	20%	April 2, 2025
Final exam	35%	Formal exam period

TEXT

Required text (openly available online):

1. IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 3–32, doi:10.1017/9781009157896.001.

2. Arias, P.A., et al., 2021: Technical Summary. In *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 33–144. doi:10.1017/9781009157896.002.
3. IPCC, 2021: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, *In press*, doi:10.1017/9781009157896.