

The Macroeconomics of Climate Change

The purpose of the course is to provide a comprehensive analysis package for studying questions relating to climate change, with a particular emphasis on policy evaluation. The macroeconomic perspective means that the course will be model-based and have a quantitative orientation: we will build toward a complete global model of the two-way feedbacks between the climate and the economy (an Integrated Assessment Model, IAM). The course is self-contained and will thus not require any prior knowledge in the field. It will, however, aim to get to the research frontier on several of the topics covered.

The readings are yet to be determined but will at least cover the (forthcoming, and as of yet incomplete) chapter in the Handbook of Macroeconomics on macro and the environment written by John Hassler, Per Krusell, and Tony Smith, plus a number of recent papers in the literature.

The examination is also yet to be determined, and may end up involving a choice. One option is a take-home exam. A second is a short paper. A third is a computational task (formulate and solve an IAM).

Building blocks (some to be covered very quickly):

The IAM will consist of a number of components, listed 1-6 below. Some of these components are standard and are expected to be well known – these will not require more than a minimum of class time. Some, however, are new (like 1, 4, and 6) and will require some more class time. The bulk of the time will, however, be spent on part 7.

1. The natural science part: greenhouse effects, energy budgets, the carbon cycle, and climate modeling.
2. Externalities in public economics: Pigou, taxes vs. other instruments, second-best.
3. Growth theory and empirics: a comprehensive, empirically oriented, model of long-run growth and optimal saving, including comments on the world income distribution.
4. Natural resource economics: Hotelling, Dasgupta-Heal.
5. Endogenous technical change: green technology developments.
6. Measuring damages: how it is done (bottom-up vs. reduced form, damage functions).
7. A complete model: putting everything together into an IAM; a sequence of models of increasing complexity (e.g., going from a static to a dynamic model and going from a one- to a many-region model).
8. Quantitative policy analysis: taxes vs. quotas, green subsidies, the Green Paradox.