

## ECONOMICS OF CLIMATIC CHANGE, ECON 347, Winter 2023

Tuesday and Thursday, 4:00 to 5:30 pm

Three (3) credits.

Prerequisites: ECON 208 and 209 or equivalent.

TA: TBA

This course delves deeply into economic concepts, both micro and macro. These are cumulative and constitute a way of perceiving the economy, including terms, assumptions, approaches and analytic results. A student who does not have a good economics background runs a risk of not keeping up with concepts.

R.D. CAIRNS, [robert.cairns@mcgill.ca](mailto:robert.cairns@mcgill.ca).

Office Hour Tuesday 2:45 – 3:45 pm.

*Please communicate with me on questions about course content in class.*

This is a course in economics, not in the causes of climate change or in science. I am not an expert in “the science” and my treatment of it is cursory. I begin by assuming that there is a serious, global problem with emissions of greenhouse gases, CO<sub>2</sub> in particular. Climate change is an *economic problem* of decisions taken by individuals and groups. I invite you “to think like an economist” in reflecting about the problem and proposals to solve it.

Economic thinking is the consistent way of making evaluations that concern different individuals and different generations. Economics endeavours, albeit imperfectly, to be holistic. The analysis in the course is complicated and uses tools from many branches of the discipline. Climatic change has been described as the greatest *externality* humanity has ever faced. An externality is an outcome of a decision that has important consequences for others that are neglected by the decision maker. Externality has been treated in economics as primarily an environmental problem and fundamentally this course is one in Environmental Economics...and then some.

By the end of this course, you should be able to evaluate critically proposals by governments, political parties, or interest groups for addressing climate change.

The topic of the course can be contentious. I ask all to be respectful of one another in communicating.

### TOPICS

1. Cost-Benefit Analysis. A response to climate change is a policy, one among several possibilities. The systematic way to evaluate policy is through cost-benefit analysis. The basics of cost-benefit analysis are presented. A major part of the analysis is discounting, which is a topic within the topic.

2. Discounting. Climate change and the policy response is not a matter of a few months; it involves the future of humanity over many, many generations, notionally to “infinity”. Evaluations of policies consider all who are affected. Because of the infinite time period of consideration, the interest or discount rate is an overriding issue. The interest (discount) rate is used to relate flows, such as emissions of greenhouse gases (GHGs), and stocks (capital goods), such as the cumulative quantities of GHGs in the atmosphere or even some measure of the level of technology. Understanding the economic questions requires having facility in manipulating the formula for net present value.
3. The fishery. The fishery is the tangible prototype for Environmental or Ecological Economics because the effects of externalities (of ill-defined property rights) in a fishery have analogies in other environmental problems. The externalities are studied in simplified models and the implications for corrective policies are discussed.
4. The forest. Historically, the forest has provided the foundation for capital theory and dynamic economics. The fact that rotations in a plantation forest recur through time makes the analysis subtle. A forest can also provide environmental benefits during a rotation. Their role is considered with reference to a classic cost-benefit study that includes a consideration of climate effects among the benefits of planting a forest.
5. Policy. A central distinction in economic policy for the environment, including climate change, is summarized in the choice of “prices vs. quantities”, or “taxes vs. cap & trade”. Static analysis of “prices vs. quantities” goes back to a great paper by Martin Weitzman in 1974; dynamic analysis of the problem is more recent and more difficult.

#### TEXTBOOK?

The course is delivered by lecture. The economics of climate change is an evolving, complicated topic. In my lectures I do not follow a textbook. There is no prescribed textbook for the course. Therefore, it is important that you attend lectures. I do not, however, take attendance.

There is an extensive reading list in a separate file (“References”) on MyCourses. The readings are important and of interest, but not required.

#### EVALUATION

*Evaluation timing and methods are subject to change in circumstances outside the university’s control.*

Evaluation consists of four components.

- Two in-class tests to be on Tuesday 30 January worth 30%, and Tuesday 9 April worth 10%.
- In addition, two assignments are to be announced during the term, worth 30% each. The assignments are to be handed in on Thursday 22 February and Tuesday

26 March. *They are to be written up in class, without any aides and under a time constraint.* Please do not ask me or the TA for help on the assignments other than for clarification.

It is important to be aware of the format of these components.

- The two tests ask for short answers, requiring only a few lines of response that must be on lines provided on a test paper. The test paper is one page long and is to be handed in. Conciseness is at a premium. I suggest that you first read a question attentively and then formulate your answer by making notes on the back of the paper. (This material will not be marked.) Write the answer itself carefully and legibly. The method can be unforgiving if you are not careful. Numerical questions may be asked but there is no need for a calculator.
- The two assignments, too, are on a one-page paper with answers to be on lines provided. Again, conciseness is at a premium and the back of the paper may be a valuable tool. It is vital to have a strong grasp of the findings of research on the assignments in order to write up the answer succinctly and well.

Once the papers are marked, I bring them to class twice before I discard them.

If you have a complaint about a mark on a test question, first take the matter up with the TA. If you still disagree with the mark and wish to come to me, I ask for a succinct, typed, one-page statement of why it should be adjusted. The entire paper will be re-marked and the statement will form part of the re-evaluation. There is a risk that the total mark for the paper will be reduced in such cases.

*While the questions themselves may appear innocuous, I am looking for economic sophistication in the answers.*

#### STATEMENTS

In accord with McGill University's [Charter of Student Rights](#), students in this course have the right to submit in English or in French any written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives.

Conformément à [la Charte des droits de l'étudiant](#) de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté, sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue.

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the [Code of Student Conduct and Disciplinary Procedures](#)." See McGill's [guide to academic honesty](#) for more information.

L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le [guide pour l'honnêteté académique de McGill](#)).