

# **P000060, The macroeconomics of sustainability, 7.5 Hp**

## **Syllabus**

Finalized by: Finalized by: People, Society and Sustainability research school, 2024-02-06, 2024-02-06

### **Level within study regulation:**

Third cycle

### **Subject:**

- Other social science

### **Grading scale:**

Pass / Failed

### **Course language:**

Swedish

### **Entry requirements:**

Accepted as a PhD student in economics.

### **Objectives:**

Upon completion of the course, the students will be able to:

- develop and use a generic macroeconomic model of natural resource use and pollution;
- analyze – with the help of the generic model – the evolution of the approach to the modelling of the extraction and use of non-renewable natural resources in a macroeconomic context with growth, starting with the Dasgupta-Heal-Solow-Stiglitz (or DHSS) model from the 1970s, and ending at the research frontier;

- analyze – with the help of the general model – models of how emissions of local, short-lived pollutants are expected to develop over time under optimal policy, related to the Environmental Kuznets Curve hypothesis;
- analyze – with the help of the generic model – the evolution of the approach to the modelling of emissions of global, long-lived pollutants such as CO<sub>2</sub>, including the damages caused by such emissions and optimal policy, starting with Nordhaus' DICE model of 1993, and ending at the research frontier;
- analyze – with the help of the generic model – approaches to the modelling of land use and the exploitation of biological natural resources.

Furthermore, students will be able to analyze in depth – through one specific recent paper published in a leading journal (good general interest or top field) – an advanced topic such as discounting and climate damages, risk and climate damages, climate policy with multiple externalities (e.g. knowledge spillovers in addition to pollution damage), the costs and benefits of environmental policy, sustainability and inequality.

- analyse, using two distinct models, the implications of different values of biodiversity for conservation and extinction
- analyse, using one-sector stochastic non-convex growth frameworks, when, and under what conditions, safe standards for conservation exist
- analyse, using extensions of one- and two-sector climate-economy models, the effects of quasi-hyperbolic discounting upon optimal carbon emissions and the value of “commitment”

## **Content:**

After setting up our generic model (which is a simplified version of models in many recent papers) the content will be focused around a series of papers. The core papers will include some of the following.

- Topic 1: the original DHSS papers from 1974, and Hart (2016).
- Topic 2: Stokey (1998), Shapiro and Walker (2018), and Hart (2020).
- Topic 3: the DICE model and Golosov et al. (2014).
- Topic 4: Macroeconomics and Conservation: valuing biodiversity (Brock and Xepapadeas (2003) and extinction of species (Weitzman (1998)).
- Topic 5: Growth models and conditions for optimal conservation and extinction (Mitra and Roy (2006) and Olson and Roy (1996))
- Topic 6: Climate change and discounting: Iverson and Karp (2021) and Gerlagh and Liski (2018)

The papers for the in-depth analysis will be chosen by the students themselves.

### **Modes of assessment:**

There will be a short written examination on the core topics, plus a written term paper containing the in-depth analysis. This paper must be submitted in advance of the final seminar, an all-day event at which students will discuss each other's work in depth. - If a student has failed an examination, the examiner has the right to issue supplementary assignments. This applies if it is possible and there are grounds to do so.

- The examiner can provide an adapted assessment to students entitled to study support for students with disabilities following a decision by the university. Examiners may also issue an adapted examination or provide an alternative way for the students to take the exam.
- If this syllabus is withdrawn, SLU may introduce transitional provisions for examining students admitted based on this syllabus and who have not yet passed the course.
- For the assessment of an independent project (degree project), the examiner may also allow a student to add supplemental information after the deadline for submission. Read more in the Education Planning and Administration Handbook.

### **Organisation:**

Department of Economics

## **Supplementary information**

### **Other information:**

- The right to participate in teaching and/or supervision only applies for the course instance the student was admitted to and registered on.
- If there are special reasons, students are entitled to participate in components with compulsory attendance when the course is given again. Read more in the Education Planning and Administration Handbook.