Economic modeling: growth and sustainable development

ECTS credits
3 credits

Semester
Spring

In brief

Course langage: French

Presentation

Prerequisites

Mathematical Modeling
Dynamic optimization

Learning objectives

Part I: Environmental, Resource, and Population Economics
This course provides an introduction to the problems of environmental and natural resource economics. Using the dynamic optimization tools studied in the other courses of the course, we cover a set of usual problems in the field: the problem of the manager of a mine, prey-predator models, fisheries models. In addition, a more "static" part of the course focuses on the need for regulation (and the tools available) to correct externalities.

Part II: Growth and economic crises
This course aims to introduce students to the main factors explaining a country's economic growth in the long run. The presentation of these factors is done through empirical evidence and stylized facts, which are used to establish the elements of reflection mobilized during the theoretical modeling of economic growth.

Description of the programme

Part I: Environmental and Resource Economics
I. Introduction
II. Optimal management of a non-renewable resource stock

III. Population models
IV. Fishery dynamics
V. Environmental policy needs and instruments
VI. Management of a stock pollutant, theoretical and numerical analysis

Part II: Growth and economic crises
I. Introduction: empirical regularities and stylized facts of economic growth
II. Exogenous growth models
III. introduction to endogenous growth models

Generic central skills and knowledge targeted in the discipline

Understanding of natural resource management using dynamic optimization.

Understanding the deep roots of economic growth.

How knowledge is tested

CC : homework 100%.
The evaluation of the UE consists of a group project. One part of the project is close to a DM summarizing the two courses of the UE. The second part of the project invites the students to pursue the DM by developing mini research projects.

Bibliography

Hotelling, H. (1931). The Economics of Exhaustible Resources. Journal of Political Economy, 39(2), 137#175. https://doi.org/10.1086/254195
Shone, R. (2003). Economic Dynamics : Phase Diagrams and their Economic Application (2e éd.). Cambridge University Press.

Sala-i-Martin, X., Barro, R. J. (2004). Economic Growth, Second Edition. Royaume-Uni: MIT Press.

Teaching team

- Nicolas Abad (Université de Rouen-Normandie)
- Nicolas Clootens

Sustainable Development Goal

Economic modeling: growth and sustainable development

Eradicating poverty

Responsible consumption and production

Climate action

Total des heures		**40h**
CM	Master class	36h
TD	Directed work	4h

Useful info

Name responsible for EU

Lead Instructor

Frédéric Schwander

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