

## Course Goals and content

The goal of the course is to provide graduate students with an understanding of general equilibrium modelling in a complementarity framework. The course will include an introduction to the GAMS algebraic modelling language. The course will cover applications in imperfect competition and environmental economics and several canonical models from the academic literature.

## Course Content

### A The Basics: Closed Economy Models

1. Translating analytic models into computer simulations: examples of optimization and complementarity in partial and general equilibrium models
2. Extensions of the textbook closed economy model: pollution externalities, optimal taxation, increasing returns and imperfect competition
3. Essential GAMS syntax for scalar applications

### B Open Economy and Multiregional Trade Models

1. Tariffs, trade costs, quotas
2. Nash equilibrium tariffs
3. Essential GAMS syntax for indexed applications

### C Historical Perspective on Applied General Equilibrium

1. Mathiesen's complementarity format
2. Partial equilibrium applications of complementarity methods: the PIES Model
3. The Miller-Spencer Model

### D Requisite Price Theory

1. Nested CES functions and their application
2. The calibrated share form
3. Non-separable CES functions – calibration and computational techniques
4. General Equilibrium Modelling with MPSGE

### E Other Applications of Complementarity with Industrial Organization and Trade

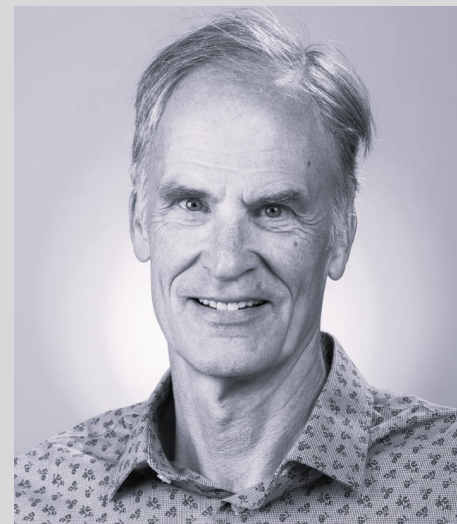
1. Theory-Consistent Endogenous Markups
2. A Heterodox Approach to Heterogeneous Firms
3. Dairy tariff quota liberalization: bilateral versus MFN reform options

## Lecturers



Professor James Markusen is a Distinguished Professor at the University of Colorado at Boulder, now retired from the department of economics. His principal interests are in the field of international trade and foreign direct investment. His research for over 40 years has concentrated on the economics of large scale firms and multinational corporations. His work also analyzes the role of non-homothetic preferences and income elasticities in explaining empirical puzzles involving trade, skilled-wage premia, and global environmental issues. He has extensively worked on analytical models, numerical simulation models, and empirical estimation.

Email: [james.markusen@colorado.edu](mailto:james.markusen@colorado.edu)



Professor Thomas Rutherford is Professor of Agricultural and Applied Economics at the University of Wisconsin. His research focuses on the formulation, solution and application of numerical equilibrium models for economic issues in environmental economics, international trade and economic growth. His work has focused on the economic analysis of global warming, the economic consequences of multi-regional trade agreements, the economic effects of trade reform in small open economies. His research has also included methodological contributions related to the application of complementarity models in economics.

Email: [rutherford@wisc.edu](mailto:rutherford@wisc.edu)

## Grading

Class participation (10%); homework (2 short assignments -- 20%); take-home exam (70%).

## Timetable

The course takes place from Monday 13.05 to Saturday 18.05. Class hours are 9am-12am (noon), 1.30pm-4.30pm.

This is an intensive course. Please try to do (some) readings already before the course-week starts. Lecture notes, data, and code are made available prior to the lecture.

Lecture hours: 36 ECTS: 6

## Organization

The course is intended for PhD students in economics or a closely related field who are interested in general equilibrium modelling with GAMS software. Students from all Swiss universities may enrol. A limited number of people with relevant professional or academic interest may be also admitted.

**Tuition fee: 500 CHF.**

**Venue:** World Trade Institute, University of Bern. Hallerstrasse 6, 3012 Bern.

Please apply online:  
<https://www.wti.org/education/doctoral-programme/>



**World Trade Institute, University of Bern**

PhD course

General Equilibrium Modelling in a Complementarity Format

13 – 18 May 2024

