



Ruhr Graduate School in Economics
University of Duisburg-Essen

Essen, Germany, July 25-29, 2005

1st Ruhr Graduate Summer School

University of Duisburg-Essen, Germany

Introduction to Computable General Equilibrium Modeling with GAMS and MPSGE

Instructors:

Professor James R. Markusen, University of Colorado

Partner Jesper Jensen, Copenhagen Economics

Professor Volker Clausen, University of Duisburg-Essen

Objective

The workshop will provide an introduction to applied (numerical) general equilibrium models constructed using GAMS and MPS/GE. The workshop addresses beginners, no previous knowledge of GE modeling is assumed, but knowledge of basic microeconomics (master's level) is important. This workshop is intended for economists and PhD-students who want to do policy analysis with real data and to economists who are more interested in using numerical modeling for simulation analysis of theoretical models.

The teaching technique we will follow consists of three steps repeated each half day: (1) a brief lecture, (2) examination and discussion of techniques via the use of simple template models, (3) exercises for the participants. All three instructors are available during the entire workshop.

The workshop will also provide an opportunity for specialized consultation on individual applications in environmental economics, international trade and dynamic applications.

Workshop Topics and Schedule

Monday, July 25:

- Morning
 - Install discuss, and explain software
 - Basic GAMS syntax: SETS, TABLES, PARAMETERS, EQUATIONS, MODELS, DISPLAY, etc.
 - Exercises
- Afternoon
 - Brief lecture on the elements and formulation of numerical GE models
 - Formulating and solving square systems of equations/inequalities
 - Micro-consistent initial data and calibration
 - Coding and replication checks
 - Examination of simple template models
 - Exercises

Tuesday, July 26:

- Morning
 - An introduction to MPS/GE, translating algebraic models into MPS/GE
 - Some simple template models
 - Exercises
- Afternoon
 - Extensions to the basic framework taught with template examples
 - Intermediate inputs and joints outputs
 - Specific factors, slack activities, labor/leisure choice
 - Multiple households
 - Exercises

Wednesday, July 27:

- Morning
 - Extension to the basic framework taught with template examples
 - Taxes in benchmark data
 - Tax reform (e.g., equal yield reforms)
 - Modeling public goods
 - Classical unemployment
 - Exercises

- Afternoon
 - Extensions to open economy models taught with template examples
 - Modeling a small open economy
 - Tariffs in the benchmark data
 - Quotas and voluntary export restraints
 - Exercises

Thursday, July 28:

- Morning
 - Economies with a benchmark trade imbalance
 - Armington formulations
 - Large open economies
 - A full two-country Heckscher-Ohlin model
- Afternoon
 - Models with scale economies and imperfect competition
 - Modeling a monopolized sector with Cournot competition
 - Cournot competition with increasing returns to scale
 - Cournot competition with free entry and exit
 - Exercises
 - Opportunity for individual consultation on user applications.

Friday, July 29:

- Morning
 - Parallel sessions on general equilibrium model applications to:
 - § International trade
 - § Large-scale modeling, calibration and spreadsheet interfaces
- Afternoon
 - Opportunity for individual consultation on user applications.

For further information on course content, please contact Jesper Jensen, jj@copenhageneconomics.com, Jim Markusen, James.Markusen@colorado.edu or Volker Clausen, vclausen@vwl.uni-essen.de.

Times and Location

Morning sessions will begin at 9am. Lunch is provided for workshop participants at noon. The afternoon sessions will run from about 1-4pm.

All sessions take place at the Department of Economics at the University of Duisburg-Essen, [Campus Essen](#):

*University of Duisburg-Essen, Campus Essen
 Universitätsstraße 12
 45117 Essen
 Germany*

Payment and Registration

The fee for participating in the training workshop is EURO 2000 and includes a workshop-license to GAMS, lectures, course materials and lunches. **Participants are required to bring a laptop with a CD-ROM drive.**

An academic discount of EURO 500 is offered for faculty from universities or colleges, EURO 1000 for graduate students.

A limited number of scholarships are available for candidates from developing countries. The scholarship only covers the participation fee and does not cover the costs of travel, accommodation, etc. To apply for a scholarship, please send a curriculum vitae and one sample of your academic work (a paper) to [Volker Clausen](#). Answers to the applications will be sent out by June 1.

To register by phone, fax, or e-mail, contact:

Course Coordinator

Julian Emami Namini

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The registration deadline is June 1. The maximum number of participants is restricted to 20. **Slots are guaranteed only upon full payment of fees (by check or bank transfer) through the GAMS Course Coordinator.** Cancellations will be fully refunded if made prior to June 1.

For further information on course content, please contact Jesper Jensen, jj@copenhageneconomics.com, Jim Markussen, James.Markusen@colorado.edu or Volker Clausen, vclausen@vwl.uni-essen.de.

Accomodations and Maps

Information on nearby hotels and links to maps of Essen can be found [here](#).

Very close to the university are the following two hotels:

Top Rema Hotel Essen, Viehofer Platz 5, 45127 Essen/Germany, +49/201/105610, essen@remahotel.de (58-81€ per night)

Ambassador Hotel, Viehofer Straße 23, 45127 Essen/Germany, +49/201/247730, info@ambassador-essen.de (55-80 € per night)

How to Prepare

Workshop participants can do a number of things to prepare for the workshop. Here are some suggestions:

- [Download](#) and install a free demo of the GAMS system software. The [GAMS User's Guide](#) is available on the web and provides a documentation of GAMS notation and syntax.
- Look at background material provided over the web, either on the [GAMS home page](#), the [MPS/GE home page at GAMS](#), or [Thomas Rutherford's web page](#).
- Read Jim Markusen's [tutorial chapters](#) and look at the corresponding [model examples](#).
- For students interested in the use of GAMS/MPSGE for doing economic theory, see James Markusen, *Multinational Firms and the Theory of International Trade*, MIT University Press, 2002.

The Instructors

James R. Markusen is Professor of Economics, University of Colorado at Boulder and Associate Editor of the Journal of International Economics. He is a specialist in the theory of international trade and direct foreign investment and is widely [published](#) in the top economic journals.

Jesper Jensen is Partner of Copenhagen Economics, a private consulting company established in 2000. He is a former employee at the Danish Ministry of Economics and Business Affairs (MobiDK Project) and is currently directing several CGE modeling projects for the World Bank, the European Commission and several European Governments.

Volker Clausen is Professor of Economics, University of Duisburg-Essen, Campus Essen. His current research interests include general equilibrium modeling with a focus on ageing in open economies. His publications have a focus on international topics and appeared in, among others, the Journal of International Money and Finance, the Journal of Economic Integration and the Review of World Economics.