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Quantitative Methods in Economic Research (320.910, KS, 3SSt)

Mo, 15:30-18:30, LS 15.03

Office Hours: Steininger: Montag, 11:00-12:30 (Institute of Economics, RESOWI F4)
Bednar-Friedl: Montag, 13:30-15:00 (Institute of Economics, RESOWI F4)
Bachner: Montag, 14:00-15:00 (Wegener Center, Brandhofgasse 5)

Homepage: Moodle <https://moodle.uni-graz.at>

Content

- Numerical simulation, optimization and visualization using mathematical computer software (Mathematica, GAMS), applied to case studies of micro- and macroeconomics, international economics and public economics,
- applied general equilibrium modeling (computable general equilibrium CGE), in particular basic models for closed and open economies, analysis of taxes and public goods,

Learning Outcomes

Upon successful completion of the module, students have the following substantive and methodological skills:

- Selection and application of appropriate quantitative methods, depending on the economic question, including their critical analysis,
- ability to apply mathematical computer software on economic issues,
- development and application of an empirical quantitative model (policy analysis),
- interpretation of results of quantitative analysis, drawing conclusions and critical discussion of the limits of quantitative modeling,

Teaching and Learning Methods:

Lecture- and discourse oriented:

- combination of lectures and discussions on methodological and applied economic issues under the supervision of the course-instructors,
- written team-seminar papers on methodological or applied economic issues, respectively;
- computer-supported teamwork.
- teaching language is English.

Learning platform

Moodle (moodle.uni-graz.at)

Schedule

Date	Topic	Literature
06.10.	Welcome and organizational issues ----- What is modeling? How CGE models work – part 1	Maria (1997) Bergman (2003) chapter 1&2 Sue Wing (2004) chapter 1-3 optional: Starfield et al. (1990)
13.10.	Presentation of home assignment 1 (as given in previous lecture) How CGE models work – part 2	Sue Wing (2004) chapter 4&5 Paltsev (2004) chapter 1&2 Böhringer et al (2003) chap. 3
20.10.	Presentation of home assignment 2 Introduction to GAMS/MPSGE – part 1	Rosenthal – A GAMS Tutorial Paltsev (2004) chapter 3
27.10.	Short Exam Introduction to GAMS/MPSGE – part 2 Simple CGE model	Markusen (chapter 1&2)
03.11.	Presentation of home assignment 3 Extensions to the simple model	Markusen (chapter 2)
10.11.	Presentation of home assignment 4 Taxes and Public Goods	Markusen (chapter 3)
17.11.	Presentation of home assignment 5 Open Economy	Markusen (chapter 4)
24.11.	Presentation of home assignment 6 Some further Issues (market power,)	Markusen (further chapters)
01.12.	Introduction to Mathematica: lecture & hands-on exercises	<i>Literature to be announced</i>
15.12.	Home assignment 7: Home assignment from previous lecture Agreement on team-projects	
12.01	Presentations of team projects 1	
19.01.	Presentation of team projects 2	
26.01.	Presentation of team projects 3 (if needed) Wrap-up of course	
31.1.	Submission of team seminar paper	

Course requirements:

The grading is based on

- (1) Completion of 7 home assignments in groups of students (2-3 persons each): each 10 points
- (2) Short exam on CGE modeling and numerical approaches: 20 points
- (3) Team project: In the second part of the course, each group will work on a specific economic problem in Mathematica. In the end, this shall provide a modeling database for future reference in the subsequent semesters. Each group will present its work in a presentation (10 points) and provide a short seminar paper (5-7 pages) stating the economic problem, its numerical implementation and presentation of results (facilitated by graphs etc.). The seminar paper yields up to 20 points.

Grading scale:

60 points and higher: Sufficient, 75 points and higher: Satisfactory, 90 points and higher: Good, 105 points and higher: Excellent.

Home assignments:

need to be uploaded within moodle before 8 p.m. on the Saturday before the unit with presentation.

In class a random procedure will be chosen to select the student out of each group who is presenting the results.

Literature for first part:

Bergman, L. (2003). An Introduction to Computable General Equilibrium Modeling. http://venus.unive.it/phd-climate-change/files/Bergman_Intro.pdf

Böhringer, C., T.F. Rutherford, W. Wiegard (2003). Computable General Equilibrium Analysis: Opening a Black Box. ZEW Discussion Paper No. 03-56. <http://ftp.zew.de/pub/zew-docs/dp/dp0356.pdf>

Maria, A. (1997). Introduction to Modeling and Simulation. Proceedings of the 1997 Winter Simulation Conference. Ed. S. Andradóttir, K.J. Healy, D.H. Withers and B.L. Nelson.

Markusen, J.R. (2002), General-Equilibrium Modeling using GAMS and MPS/GE. (Textbook)

Paltsev, S. (2004). Moving from Static to Dynamic General Equilibrium Economic Models (Notes for a beginner in MPSGE).). MIT Joint Program on the Science and Policy of Global Change. Technical Note 4, 2004. http://test2-globalchange.mit.edu/files/document/MITJPSPGC_TechNote4.pdf

Rosenthal, R.E. – A GAMS Tutorial.

Starfield, A.M., K.A. Smith, A.L. Bleloch (1990). How to model it. Problem Solving for the computer age. McGraw-Hill Publishing Company.

Sue Wing, I. (2004). Computable General Equilibrium Models and Their Use in Economy-Wide Policy Analysis: Everything You Ever Wanted to Know (But Were Afraid to Ask). MIT Joint Program on the Science and Policy of Global Change. Technical Note 6, 2004. http://mit.edu/globalchange/www/MITJPSPGC_TechNote6.pdf