



## Recursive Methods and Simulations in Macroeconomics

Recursive methods and their numerical application have become the most important solution methods in modern macroeconomics. The areas of their application today encompass almost all areas of macroeconomics, for example growth theory, monetary economics, social insurance, fiscal policy. Despite their widespread use in research, they have not yet become part of the standard curriculum at European economic faculties. The course aims at closing this gap. It introduces both theory and simulation of recursive methods.

### Seminar Benefits

Researchers broaden their methodological expertise and improve programming skills

### Required Knowledge

Basic macro- and microeconomic theory as well as calculus

### Target Group

PhD students and postgraduates in macroeconomics as well as researchers in the financial sector

### Learning and Teaching Methods

Presentations and workshop sessions on programming practical exercises with MATLAB

### Seminar Date and Location

October 9 to 11, 2009

9:00 am – 5:30 pm

Centre for European Economic Research (ZEW) in Mannheim, Germany

### Seminar Fee

EUR 850,- (plus VAT)

The number of participants is limited.

### Seminar Organisation

In case of questions concerning the organisation of the seminar or an accommodation please contact Vera Pauli,  
Telephone: 0049/621/1235-240, Fax 0049/621/1235-244,  
E-Mail pauli@zew.de

## Programme

November 9 to 11, 2009

### Numerical Basis

- Optimization: One-Dimensional Methods, Newton and Quasi-Newton Methods
- Non-Linear Equations: Newton Algorithm, Gauss-Seidel and Gauss-Jacobi Method
- Approximation Methods

### Dynamic Programming

- Theory: Bellman equation and Euler equation
- Discretization of the Bellman equation
- Solving the Bellman equation by approximation

### Projection Methods

- Projection Methods and differential equations
- Solving the Euler equation with projection methods

## Tutors



**Dr. Alexander Ludwig, Mannheim Research Institute for the Economics of Aging (MEA)**, studied Economics at the Universities of Mannheim and California at Berkeley. In 2001 he began his graduate studies at the University of Mannheim, the Mannheim Research Institute for the Economics of Aging and the University Pompeu Fabra, Barcelona. Since 2005 he worked as head of the research unit "Macroeconomics" at MEA. From October 2009 on he will be Professor for Macroeconomics at Cologne University. He works in the following research areas: Dynamic macroeconomics, public finance, computational economics, growth and decision theoretic applications to macro questions.



**Dr. Tim Menzel, ZEW**, studied Mathematics at the Universities Bonn and Paris VII, graduating in December 1998 with a Diploma thesis in the area of Algebraic Topology. After an internship he began his graduate studies of economics in October 1999 at the Bonn Graduate School of Economics (BGSE). In 2001 he visited the Graduate Program of Economics and Management of the University Pompeu Fabra (UPF), Barcelona, as a European Doctoral Programme (EDP) exchange student. At UPF and after his return to Bonn he worked in the area of dynamic principal-agent models. In 2004 he received his PhD from BGSE with a thesis on optimal unemployment insurance. Since October 2005 he is employed at the ZEW in the research department "Environmental and Resource Economics, Environmental Management". He works on quantitative modelling of environmental and energy policy.