

## M.Sc. Economics

<b>Code:</b>	017 901	<b>Type:</b>	MSc 2011-2013, 1 <sup>st</sup> year, Fall 2011
<b>Title:</b>	Computational Methods		
<b>Lecturer:</b>	Tamás Papp		
<b>ECTS:</b>	3	<b>Contact hours (per semester):</b>	10 á 120 min
<b>Semester:</b>	Fall 2011	<b>Frequency of the lecture:</b>	Twice a week
<b>Dates:</b>	October 27 <sup>th</sup> until December 2 <sup>nd</sup> , 2011, Final Exam Dec 16 <sup>th</sup> , 2011		
<b>Prerequisites:</b>	None		
<b>Learning objectives</b> (What are the intended learning outcomes? Which skills will be acquired?):			
<ul style="list-style-type: none"> <li>▪ Introduction of basic numerical techniques (solving linear and nonlinear equations, optimization, numerical integration etc), especially those that are used in economics,</li> <li>▪ development of programming skills in general.</li> </ul>			
<b>Content</b> (Which professional competence and which contents will be imparted?):			
<ul style="list-style-type: none"> <li>▪ Basics of computer programming, introduction to the R programming language.</li> <li>▪ Numerical differentiation, errors in floating point arithmetic.</li> <li>▪ Numerical linear algebra.</li> <li>▪ Nonlinear constrained and unconstrained optimization, univariate and multivariate methods.</li> <li>▪ Nonlinear systems of equations.</li> <li>▪ Numerical integration.</li> <li>▪ Function approximation.</li> </ul> <p>Various economic applications, including:</p> <ul style="list-style-type: none"> <li>▪ Computation of steady states.</li> <li>▪ Solving deterministic and simple stochastic models.</li> </ul>			
<b>Teaching approach</b> (Description of the learning and teaching methods):			
Lecture and group work			
<b>Workload</b> (Definition of workload (ECTS), divided in pre-modules (e.g. pre-readings), core-modules (contact hours), post-modules (e.g. case studies)):			
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<b>Language of instruction</b> (Information on the language of teaching):			
English			

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### Obligatory literature (E.g. scripts, books, articles, cases, papers):

- Mario J. Miranda and Paul L. Fackler: Applied Computational Economics And Finance; Chapters 1–6
- Class notes

### Additional literature (E.g. books, articles, cases, papers):

- Kenneth L. Judd: Numerical Methods in Economics; Chapters 1–7

### Mode of examination (Mode of the examinations and tests (e.g. oral or written examination, lecture, homework, papers, class participation):

- Homeworks (cooperation is encouraged)
- Midterm examination
- Final examination

**Students are reminded that the use of somebody else's computer code without proper referencing is considered plagiarism and can lead to expulsion from the program.**

### Grading:

- Homeworks (20%)
- Midterm examination (30%)
- Final examination (50%)

### Special features (E.g. excursion, guest speaker):

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### Contact information:

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### Office hours:

By appointment  
Room A 314  
**Please make an appointment in advance!**

### Course website:

<https://cecnet.tuwien.ac.at/>