

M.Sc. Economics

Code:		Type:	M.Sc. 2 nd semester lecture series
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Title:	Dynamic Optimization I		
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Lecturer:	Christian Haefke		
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ECTS:	3	Contact hours (per semester):	12 á 90 min.
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Semester:	Summer 2010	Frequency of the lecture:	Once a week
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Dates:	March 4 th , 2010 until June 10 th , 2010		
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Prerequisites:	Macro I, Micro I, Mathematics I and II, Computational Methods		
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Learning objectives (What are the intended learning outcomes? Which skills will be acquired?):

This course serves as a rigorous introduction into the methods and techniques used for the analysis of dynamic optimization problems using functional equations: dynamic programming. We will derive the main results in deterministic dynamic optimization and discuss methods of numerically solving such models.

After the course students should understand the assumptions underlying key dynamic programming results, the limits of its methods, and know how to apply these methods to a wide range of economic problems.

Content (Which professional competence and which contents will be imparted?):

- Optimization: unconstrained optimization, quasiconcave functions, Lagrange method, Kuhn-Tucker method.
- Linear quadratic problems, Kalman filter.
- Sequential problems; recursive problems and their equivalence, Bellman equations, Benveniste Scheinkman Theorem, Contraction Mappings, Blackwell's sufficient conditions.
- Log-Linearization, Guess and Verify, Value function iteration, policy function iteration.

Teaching approach (Description of the learning and teaching methods):

Lecture and group work, programming exercises.

Workload (Optional: definition of workload (ECTS), divided in pre-modules (e.g. pre-readings), core-modules (contact hours), post-modules (e.g. case studies)):

Class: 36 hours, Practice sessions: 12 hours, Problem sets: 10 hours, preparation final exam: 14 hours, pre-and post processing of lectures: 18 hours, total: 90 hours

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Language of instruction (Information on the language of teaching):

English

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

- Acemoglu, D.: "Introduction to Modern Economic Growth", Princeton University Press, 2009.
- Alós-Ferrer, Carlos: Mathematics for Economists.

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

- Sargent, T. J. and L. Ljungqvist (2004), Recursive Macroeconomic Theory, 2nd edition, MIT Press.
- Recursive Methods in Economic Dynamics, by Nancy L. Stokey and Robert E. Lucas Jr. with Edward C. Prescott (SLP). Harvard University Press, 1989.

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

Assignments, quizzes, and a final exam.

Grading:

- 5 Assignments: 20%
- 3 Quizzes: 30%
- Final Exam: 50%

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

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Contact information:

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Office hours:

Monday, 16.30 – 18.00

Course website:

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