

Prof. Dr. Reinhard Madlener, Chair of Energy Economics and Management

Lecture in “Economics of Technical Change“ (v2/Ü2, 18ss-19317)

Description

Economics of technical change addresses technological and organizational improvements at the core of economic growth. Following a micro- and macroeconomics approach, this course sheds light on basic concepts at the root of technical change and traditional economic theories. Thus, emphasis is put on the dynamics behind investments in R&D, innovation adoption and diffusion as well as organizational, institutional and structural change. Examples and empirical evidence (e.g. on the energy and telecom industry) are provided in support of the theory. Among other topics, the course tackles industrial measures designed to enhance knowledge protection and transfer – such as standardization, intellectual property and patenting –, but also path dependence and lock-in effects, endogenous growth theories, and structural change. In this context, policy perspectives and implications are addressed as well.

Organization

Successful participation in this course requires registration via CAMPUS and passing of a written exam¹ (60 minutes) at the end of the course. Weekly exercise units will accompany the lecture. Slides and additional material will be provided via the e-Learning platform (L²P). Date and venue of lectures and exercise units are available on CAMPUS as well as under the [“Academics” section of the FCN website](#).

Timetable and contents

Teaching unit	Topic/s covered	Lecture (Thursdays 12:15- 13:45 hrs)	Exercise unit (Thursdays 14:15- 15:45 hrs)	Textbook chapter/s
1	Introduction; Basic definitions and concepts	Apr 12	Apr 12	[1] Ch. 1; [4] Ch.3
2	Knowledge as a public good	Apr 19	Apr 19	[8] Ch. 4
3	Intellectual property, patents, and open technologies	Apr 26	Apr 26	[1] Ch. 9
4	Standardization & competition; Adoption of technology	May 3	May 3	[3] Ch. 3, 4, 14; [7] Ch.4
	No lecture/ No exercise unit	May 10 (holiday)	May 10 (holiday)	-
5	Diffusion of technology	May 17	May 17	[1] Ch. 16; [8] Ch. 7
	Excursion week	May 24 (no class)	May 24 (no class)	-
	No lecture/ No exercise unit	May 31h(holiday)	May 31 (holiday)	-
6	Regional aspects of innovation and diffusion	Jun 7	Jun 7	[6] Ch. 61; [4] Ch.3
	No lecture/ No exercise unit	Jun 14	Jun 14	-
7	Financing aspects of investments in R&D	Jun21	Jun21	[8] Ch. 8
8	Path dependence and lock-in	Jun 28	Jun 28	[1] Ch. 3,5; [5] Ch. 1,4,10
9	Innovation, structural change, GPTs, and economic growth	Jul 5	Jul 5	[1] Ch. 14; [2] Ch. 1
10	Policy considerations	Jul 12	Jul 12	[8] Ch. 12
11	Q&A	Jul 19	Jul 19	-

Preparation for the exam

For a good understanding of each lecture topic, we recommend you to base your preparation on the lecture slides as well as on the material contained in the L²P folder “Compulsory literature”. Compulsory literature comprises the textbook chapters mentioned above and selected seminal papers. Attendance of the lectures and exercise units is of course useful and recommended, but not a prerequisite for successfully accomplishing the course.

¹ The written examination will take place on August 8, 2018 (1st session), and September 25, 2018 (2nd session).

Learning goals

- Getting a sound understanding of definitions and concepts characterizing the economics of technical change
- Being able to clearly illustrate economic theories and policies presented during the course with the provision of *ad-hoc* examples
- Being able to take part in interdisciplinary discussions
- Being able to screen and use the literature on the economics of technical change for your own purposes
- Being able to apply the knowledge gained during the course to the analysis of real-world problems

Group of participants

Enrolment to this course is mainly open to master's students from business administration, economics, as well as engineering economics and related fields. In order to know whether you are allowed to take this course, please get in touch with your study advisor.

Prerequisites: Basic knowledge of microeconomics.

Relevant literature (selection)

[1] Antonelli, C. et al. (Eds.) (2006). *New Frontiers in the Economics of Innovation and New Technology. Essays in Honor of Paul A. David*, Edward Elgar, Cheltenham, UK and Northampton, Mass., USA.

[2] Barro, R.J and Sala-i-Martin, X. (2004). *Economic growth*. The MIT Press, Second Edition, Cambridge, Massachusetts.

[3] Blind (2004). *The Economics of standards: theory, evidence, policy*. Edward Elgar, Cheltenham, UK; and Northampton, Mass., USA

[4] Dicken, P. (2007). *Global shift. Mapping the changing contours of the world economy*; SAGE Publications, 5th Edition, London

[5] Garud, R. and Karnøe, P. (2001) *Path dependence and creation*. Psychology Press; 1st edition (Feb. 2001), East Sussex

[6] Handerson, J. V. and Thisse, J.F. (2004) *Handbook of Regional and Urban Economics*, Elsevier, Vol.4 : 2063-3073, North Holland

[7] Shy, O. (2001). *The Economics of Network Industries*. Cambridge University Press.

[8] Stoneman, P. (Ed.)(1995). *Handbook of the Economics of Innovation and Technological Change*, Blackwell, Oxford, UK and Cambridge, USA

Further information

For questions concerning topics, please write an e-mail to Siamak Sheykhha (siamak.sheykhha@eonec.rwth-aachen.de, Office hours by arrangement, E.ON Energy Research Center, Room 10.21). For general information about the Chair of Energy Economics and Management please visit the [FCN Website](#).