



Course Information

Course Code	8310503
Course Section	1
Course Title	ECONOMICS OF SCIENCE, TECHNOLOGY AND INNOVATION
Course Credit	3
Course ECTS	8.0
Course Catalog Description	An introduction to political economy of science, technology, and policy. Basic concepts, alternative theories, and recent developments in the economics of technology and innovation. Characteristics of technological activity: patterns of technological activity and markets for technology. Comparative analyses of science and technology policies in industrial and developing countries, and the experience of NICs. Interactions between technology (policy) and society.
Prerequisites	No prerequisites
Schedule	Not available

Instructor Information

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Office Hours	Mondays 14:00-17:00

Course Objectives

By the end of this course the students

- will be able to understand the complex as well as basic terminology and concepts in economics of science, technology and innovation
- will be able to critically analyse any reading material (to a certain extent journal articles as well) on STI
- will be able to understand and connect different perspectives when analysing STI related policy

Course Learning Outcomes

By the end of this course the students

- will understand the theoretical setting of main science, technology and policy concept
- will be able to analyse STI related documents under neo-classical and evolutionary perspectives
- will have a knowledge of STI terminology

Tentative Weekly Outline

Week	Topic	Relevant Reading	Assignments
1	Introduction		
2	Concepts of Science, Technology and Innovation		
3	Science, Technology and Knowledge		
4	Lock-in and path-dependence		
5	Schumpeter, entrepreneur and evolutionary economics		



Week	Topic	Relevant Reading	Assignments
6	Diffusion of technology		
7	Long-waves, Kondratieff waves, Technological Paradigms		
8	Midterm break	See the grading policy	
9	Mainstream: Solow and neo-classical growth		
10	Technology and growth: endogenous technology		
11	STI Policy Theory and Practice		
12	Ethics		
13	Ethics		
14	Ethics		

Course Material(s) and Reading(s)

Material(s)

Reading list according to topics. The full list and more will be provided to students via google drive.

Reading(s)

Introduction

Dosi G. and Nelson, R. (2010), Technical change and industrial dynamics as evolutionary processes, in Hall, B. and Rosenberg eds., *Handbook of Economics of Innovation*, pp. 52-127.

Concepts of STI

Dodgson, M. and Gann, D. (2010) *Innovation: A very short introduction*, Oxford University Press

Science, Technology and Knowledge

Nelson, R. (1959), The Simple Economics of Basic Scientific Research, *Journal of Political Economy*, 67 (3), 297-306.

Cowan, R. & Foray, D. (1997), The economics of codification and the diffusion of knowledge, *Industrial and Corporate Change*, 6 (3), 595-622

Cowan, R. and David, P. and Foray, D. (2000), The explicit economics of knowledge codification and tacitness, *Industrial and Corporate Change*, 9 (2), 211-253

Lock-in and path-dependence

Arthur, B. (1989), Competing technologies, increasing returns and lock-in by historical events, *Economic Journal*, 99, 116-131.

David, P. (1985), Clio and the economics of QWERTY, *American Economic Review*, 75 (2), 332-7

Cowan, R. (1990), Nuclear power reactors: A study of technology lock-in, *Journal of Economic History*, 50, 541-567.

Cowan, R. (1991), Tortoises and Hares: Choice among technologies of unknown merit, *Economic Journal*, 101 (July), 801-814.

Cowan, R. ve Gunby, P. (1996), Sprayed to death: Path dependence, lock-in and pest control strategies, *Economic Journal*, 106, 521-542

PART II: INNOVATION AND GROWTH



Schumpeter, entrepreneur and evolutionary economics

Langlois, R. and Eve, M. (1993) 'What is Evolutionary Economics?' in Magnusson, L. (eds) *Evolutionary and neo-Schumpeterian Approaches to Economics* Kluwer: Boston, pp. 11-48.

Dosi G. and Nelson, R. (2010), 'Technical change and industrial dynamics as evolutionary processes?', in Hall, B. and Rosenberg eds., *Handbook of Economics of Innovation*, pp. 52-127.

Dopfer, K. (2007), 'The pillars of Schumpeter's economics: micro, meso, macro?', in Hanusch, H. and Pyke, A. (eds), *Elgar Companion to Neo-Schumpeterian Economics*, pp. 65-77.

Grebel, T. (2007) 'Neo-Schumpeterian perspectives in entrepreneurship research?', in Hanusch, H. and Pyke, A. (eds), *Elgar Companion to Neo-Schumpeterian Economics*, pp. 147-158.

Rahmeyer, F. (2007), 'From a routine-based to a knowledge-based view: towards an evolutionary theory of the firm?', in Hanusch, H. and Pyke, A. (eds), *Elgar Companion to Neo-Schumpeterian Economics*, pp. 159-181.e of Firm

Nelson, R. (1993), 'The Role of Firm Difference in an Evolutionary Theory of Technical Advance?', in Magnusson, L. (eds) *Evolutionary and neo-Schumpeterian Approaches to Economics*, Kluwer: Boston, pp. 231-242.

Diffusion of technology

Soete, L. and Turner, R. (1984), 'Technology diffusion and the rate of technical change', *Economic Journal*, 94 (375), 612-623.

Stoneman, P. (2007) 'Technological diffusion: aspects of self-propagation as a neo-Schumpeterian characteristic?', in Hanusch, H. and Pyke, A. (eds), *Elgar Companion to Neo-Schumpeterian Economics*, pp. 377-385.

Lăuça, F (2007), *Innovation and demand*, in Hanusch, H. and Pyke, A. (eds), *Elgar Companion to Neo-Schumpeterian Economics*, pp. 766-774.

Perez, C. (2007), *Finance and technical change: a long-term view*, in Hanusch, H. and Pyke, A. (eds), *Elgar Companion to Neo-Schumpeterian Economics*, pp. 775-779.

Long-waves, Kondratieff waves

<http://faculty.washington.edu/krumme/207/development/longwaves.html>

MIDTERM BREAK

continued from other below.....

Other

Main stream: Solow and neo-classical growth

Solow, R.M. (1956), 'A contribution to the theory of Economic growth', *Quarterly Journal of Economics*, 70(1), 65-94.

Solow, R.M. (1957), 'Technical change and the aggregate production function', *Review of Economics and Statistics*, 39, 312-320.

Abramowitz, M (1993), 'The search for the sources of growth: areas of ignorance, old and new', *Journal of Economic History*, 53(2), pp. 217-43.

Technology and Growth: Endogenous growth?

Romer, P. (1990), 'Endogenous technical change', *Journal of Political Economy*, pp. 71-102

Verspagen, B. (1992), 'Endogenous innovation in neo-classical growth models: a survey', *Journal of Macroeconomics*, 14(4), 631-62.

Aghion, P. and Howitt, P. (1992), 'A model of growth through creative destruction', *Econometrica*, 60, 323-351.

Romer, P. (1994), 'The origins of endogenous growth', *Journal of Economic Perspectives*, 8 (1), 3-22.

PART III: SPECIAL TOPICS

System approaches to innovation

Edquist, C. (1997), 'Systems of innovation approaches ? their emergence and characteristics?', in C. Edquist (eds) *Systems of Innovation. Technologies, Institutions and Organisations*, Routledge: London, pp. 1-35.

Lundvall, B.A. (eds) (1992), *National Systems of Innovation: Towards a theory of innovation and interactive learning*, Pinter Publishers, London.

Nelson, R. (1992), 'National innovation systems: a retrospective on a study', *Industrial and Corporate Change*, 1 (2), 347-374.

Nelson R. (1993), *National Innovation Systems*, Oxford University Press: Oxford.



Patel, P. and Pavitt, K. (1994), National innovation systems: why they are important and how they might be measured and compared, *Economics of Innovation and New Technology*, 3, 77-95.

Soete, L., Verspagen, B., and ter Weel, B. (2010), "Systems of Innovation", in Hall, B. and Rosenberg eds., *Handbook of Economics of Innovation*, VOL 2, pp. 1160-1180.

Carlsson, B. (2007), "Innovation systems: a survey of the literature from a Schumpeterian perspective", in Hanusch, H. and Pyke, A. (eds), *Elgar Companion to Neo-Schumpeterian Economics*, pp. 857-871.

Fagerberg, J. ve Srholec, M. (2009), "Innovation systems, technology and development: Unpacking the relationships", in Lundvall, B.A., Joseph, K.J., Chaminade, C. and Vang, J. (eds.) *Handbook of innovation systems and developing countries*, Edward-Elgar: Cheltenham, pp. 337-359.

Policy: Neo-classical versus evolutionary perspectives - theory and practice

This session will be a brief introduction to two theories. The students are expect to bring policy tool examples to class and we will try to merge two taxonomies in to one in an interactive way.

Lipse, R. (1998), Technology policy in neo-classical and structuralist-evolutionary model, *STI Review*, 22, 31-74.

Metcalfe, J.S. (1994), Evolutionary economics and public policy, *Economic Journal*, 104(425), 931-944.

Steinmuller, E. (2010), "Economics of Techology Policy", in Hall, B. and Rosenberg eds., *Handbook of Economics of Innovation*, VOL 2, pp. 1182-1218.

Dopfer, K. (1993), "The Phenomenon of Economic Change: Neoclassical vs. Schumpeterian Approaches", in Magnusson, L. (eds) *Evolutionary and neo-Schumpeterian Approaches to Economics*, Kluwer: Boston, pp.125-172.

Assessment of Student Learning

Assessment	Dates or deadlines
Midterm	8th week
Final	Final week
Homework	There could be 1 or 2 10-15 pts assignments

Course Grading

Deliverable	Grade Points
Midterm	40
Homework	10
Final	40
Participation	10
Total	100