



Национальный исследовательский университет «Высшая школа экономики»
Программа дисциплины «**Экономика инноваций**» для направления 38.04.02 «Менеджмент» и
«Управление в сфере науки, технологии и инноваций», подготовки магистра

**Федеральное государственное автономное образовательное учреждение
высшего образования
"Национальный исследовательский университет
"Высшая школа экономики"**

Институт статистических исследований и экономики знаний

Рабочая программа дисциплины

«Экономика инноваций»

для направления 38.04.02 «Менеджмент» подготовки магистра

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Утверждена Академическим руководителем магистерской программы
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Настоящая программа не может быть использована другими подразделениями университета и другими вузами без разрешения подразделения-разработчика программы.

Economics of Innovation

1. Introductory note

Program authors: Dirk Meissner

General Description of the Program:

The course is delivered to bachelor and master students of The National Research University - Higher School of Economics/HSE. It is delivered in modules. The course length is **342** academic hours in total of which **96** hours are class room hours for lectures and seminars and **246** hours are devoted to self study.

Academic control forms are one written exam, one essay and one colloquium.

Pre-requisites

- Basics of economics and / or management
- Basics of policy and institutional analysis
- Basic understanding of the relationships between STI and socio-economic development
- Interdisciplinary and systemic thinking

Course Objective

The course spans 2 academic modules. The teaching is based on selected writings and experiences of members of the international laboratories for Science and Technology Studies and Economics of Innovation. In addition selected reputed scholars and experts are invited bringing together views from different perspectives on science, technology and innovation, e.g. economics, policy studies, business management, sociology to provide in-depth learning opportunities for all students.

Lectures are designed to deliver theoretical frameworks and international experiences. In addition a concluding session in each lecture is devoted to the applicability of the international experiences and the theoretical framework to the Russian context. Eventually the final lecture of the course, as well as drawing together the contributions of the previous weeks, elaborates the potentials and limitations of the theoretical knowledge taught (including that drawing on international experiences) for innovation actors in the framework of the Russian Federation. The course is accompanied by a seminar, and some sessions will feature additional foreign experts. Accompanying seminars introduce and develop new approaches to understand and further develop different facets of innovation thinking and to provide participants with ready to use state of the art knowledge as well as academic training.

Course Language: English.

Abstract

The course introduces the basic theories and concepts underlying the state of the art economics. Innovation and technical change is central to long-term economic growth but it is treated very differently in economic theories. In a comparative manner this course presents technical change within major theoretical approaches: neoclassical and endogenous growth models and evolutionary structural models. Particular attention is given to an economic model combined with a spatial theoretical framework of regional trajectories of growth. The model is based upon complementarities around innovations forming development blocks that are driving processes of structural change. Thus, the interplay between innovations, economic transformation and economic growth is studied with an emphasis on major carrier branches both historically and in contemporary times.

The course will discuss different types of STI cooperation between different actors, e.g. institutions of higher education, research institutes and companies of different countries. Such linkages take various forms, e.g. formal and informal or project related and in the long term unspecified. For each form of STI linkage and co-operations the special characteristics will be discussed. A major stream of the course is devoted to international (multilateral) research facilities which impose special challenges to national STI policy and management.

The course describes approaches of measuring the impact of STI on socio-economic development. Furthermore, factors governing the diffusion of innovations - including the interplay between economic and institutional change - are studied. The concept of innovation systems and the underlying theoretical approaches are a major element of the course

Training Objectives

- up to date knowledge on STI
- training of interdisciplinary and systemic thinking
- training of problem identification and solution

Target audience

- Master students

Competences

- Ability to analyze innovation systems
- Skills for analyzing innovation system governance models
- Understanding and designing linkages within innovation systems
- Benchmarking countries against innovation performance

2. Thematic Plan

- a) Lectures

Module	topic	academic hours	class-room hours	Self study
1 Perspectives on innovation	Economics of knowledge and STI: an overview	12	4	8
	The emergence of “innovation” as a core concept and ambition	12	4	8
	Evolutionary economics: theory and empirical applications	13	4	9
	<i>total</i>	<i>37</i>	<i>12</i>	<i>24</i>
2 STI in contemporary innovation systems	Connecting enterprises and the science base: university-industry links	13	4	9
	Innovation as systemic phenomenon, national, regional and sectoral innovation systems	13	4	9
	Knowledge Intensive Business Services	13	4	9
	<i>total</i>	<i>39</i>	<i>12</i>	<i>24</i>
3 Regulation and financing of innovation	Innovation ecosystems	13	4	9
	Funding of STI	13	4	9
	Public Services and Public Sector Innovation	13	4	9
	Capturing value from STI	13	4	9
	<i>total</i>	<i>52</i>	<i>16</i>	<i>32</i>
4 Current trends in STI	Globalization of science and technology	13	4	9
	Public Private Partnerships for STI	13	4	9
	Digitalization of innovation	13	4	9
	STI Governance in Russia	13	4	9
	<i>total</i>	<i>52</i>	<i>16</i>	<i>32</i>
	total	180	56	124

b) seminars

The seminar consists of an introductory session which highlights the phenomena in discussion, introduces the theoretical background and practical applicability. Supervision of students will be offered using a mid term interim presentation of additional information and facts by the supervisor and individual consultations during the seminar. Following these introductory session students will develop a practical applicable concept for a given problem which is based on sound scientific grounds. The session ends with the introduction of core themes for which the students are asked to prepare a presentation. Finally these concepts are introduced in a concluding session which is devoted to presentations of concepts developed by students and a concluding discussion of these concepts from both a scientific and a practical view. Students will develop concepts in teams and be supervised during development of their concepts

Topic	Total academic hours	Class hours	Self study
Introductory presentation	38	12	26
Interim presentation / individual consultations	60	16	44
Presentations	64	12	52
	Total	162	122

3. Basic literature

- Fagerberg, J., Mowery, D., Nelson R. (2004) (eds). The Oxford Handbook of Innovation Oxford: Oxford University Press, 2004
- Bessant, J., Tidd J. (2009). Managing Innovation: Integrating technological, market and organizational change. Chichester: Wiley
- Rogers, E.M. (1995). Diffusion of innovations (4th edition). The Free Press. New York.
- Freeman, C, Soete, L. (1997). The Economics of Industrial Innovation, Third Ed., London: Pinter
- Frascati Manual 2002. Proposed Standard Practice for Surveys on Research and Experimental Development. 2003. OECD. available at <http://www.oecd.org/bookshop?pub=922002081P1>
- Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition. 2005. OECD & Eurostat. available at <http://www.oecd.org/dataoecd/35/61/2367580.pdf>
- Meissner D., Gokhberg L., Sokolov A. (eds.) (2013) Science, Technology and Innovation Policy for the Future - Potentials and Limits of Foresight Studies. Springer, Heidelberg/ New York/ Dordrecht/ London

4. Education control forms

Final control: written exam after final lecture (120 minutes multiple choice exam (*F*), essay or project work in seminar (*E*) and presentation (*P*).

The overall course grade (10-point scale) is calculated as a sum of

$$G = 0,5 * F + 0,5 * (0,5E + 0,5P)$$

The overall course grade *G* (10-point scale) includes results achieved by students in their exam *F*, essay *E* and presentation *P*.

Summary Table: Correspondence of ten-point to five-point system's marks

Ten-point scale [10]
1 – unsatisfactory
2 – very bad
3 – bad
4 – satisfactory
5 – quite satisfactory
6 – good
7 – very good
8 – nearly excellent
9 – excellent
10 – brilliant

6 Programme Contents

Module 1- Perspectives on Innovation

Topic 1. Economics of knowledge and STI

Topic outline:

- Technology as artefacts and as knowledge; R&D and other sources of technological knowledge;
- Innovation as an economic phenomenon

Main references/books/reading:

- OECD: Managing National Innovation Systems. Organisation for Economic Co-Operation and Development, Paris 1999
- Myers, M. B.; Rosenbloom, R. S.: Rethinking the role of research – leadership in innovation requires mastering ‘radical incrementalism’. Research, Technology, Management, May / June 1996, S. 14-18
- Chapter 15 (von Tunzelmann) in Jan Fagerberg, David Mowery, and Richard Nelson (eds) The Oxford Handbook of Innovation Oxford: Oxford University Press, 2004
- Cohen, W and Levinthal, D. (1990), “Absorptive Capacity: A New Perspective on Learning and Innovation,” Administrative Science Quarterly 35: 123–13.

Topic 2 The emergence of “innovation” as a core concept and ambition

Topic outline:

- Main types of innovation defined
- Meaning and typologies of technology, knowledge and innovation
- General features and characteristics of innovation, technology and knowledge

Main references/books/reading:

- Chapters 1 (Fagerberg), 4 (Pavitt), 17 (Hall) in Jan Fagerberg, David Mowery, and Richard Nelson (eds) The Oxford Handbook of Innovation Oxford: Oxford University Press, 2004
- B. Godin (2008), Innovation: the History of a Category, Working Paper No. 1, Project on the Intellectual History of Innovation, Montreal: INRS. Online at <http://www.csiic.ca/PDF/IntellectualNo1.pdf> Chapters 1 and 2 of A Cawson, L Haddon and I Miles, 1995, The Shape of Things to Consume
- Aldershot, Avebury available at website http://www.scribd.com/doc/3494210/Shape-of-Things-to-Consume-whole-text?in_collection=2290941 ans at: <http://analysees.co.uk/PDF/The-Shape-of-Things-to-Consume.pdf>

Topic 3. Evolutionary economics: theory and empirical applications

Topic outline:

- Evolutionary and other lines of study, approaches to research, management and measurement
- Comparative analysis of national innovation systems
- Innovation system components and their interplay
- Inventory of innovation system elements and assessment

Main references/books/reading:

- Freeman, C. (1991), “Networks of Innovators: A Synthesis of Research Issues,” Research Policy 20: 499–514.

- Chapter 3 (Powell) and Chapter 7 (Edquist), 14 (Malerba) in Jan Fagerberg, David Mowery, and Richard Nelson (eds) *The Oxford Handbook of Innovation* Oxford: Oxford University Press, 2004
- Lundvall, B.-Å. (ed.) (1992), *National Systems of Innovation: towards a Theory of Innovation and Interactive Learning*, London: Pinter
- B.-Å. Lundvall, B. Johnson, E. S. Andersen, B. Dalum, National systems of production, innovation and competence building, *Research Policy* 31 (2002) 213–231.
- Jacobsson, S. Bergek A., *Innovation system analyses and sustainability transitions: Contributions and suggestions for research*, *Environmental Innovation and Societal Transitions*, Vol 1 (2011), pp 41-57.

Module 2. STI in contemporary innovation systems

Topic 1 Connecting enterprises and the science base: University-Industry-links I /II

Topic outline:

- Connecting enterprises and the science base: University-industry links
- Fundamental and applied research, commercialisation and spin-offs

Main references/books/reading:

- Chapter 8 (Mowery) in Jan Fagerberg, David Mowery, and Richard Nelson (eds) *The Oxford Handbook of Innovation* Oxford: Oxford University Press, 2004
- Institute of Innovation Research, 2003, *Knowing How, Knowing Whom: A Study of the Links between the Knowledge Intensive Services Sector and The Science Base*,
- IOIR; Report to the Council for Science and Technology available at: <http://www.cst.gov.uk/cst/reports/files/knowledge-intensive-services/services-study.pdf>
- X. Peng 2006, University spin-offs: Opportunity or challenge?, *Nature Materials* 5, 923 - 925 at: <http://www.nature.com/nmat/journal/v5/n12/full/nmat1790.html>

Topic 2 Innovation as systemic phenomenon, national, regional and sectoral innovation systems

Topic outline:

- networks of actors to generate ideas, inventions and innovation
- national, regional and micro (e.g.) company perspective
- organization of networks to generate innovation

Main references/books/reading:

- Edquist, C. 1997 (edt.), *Systems of Innovation: Technologies, Institutions and Organizations*, London 1997
- Freeman, C.: *Technology and Economic Performance: Lessons from Japan*, Pinter, London.1987
- Lundvall, B. A. (edt.): *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*. London, NewYork: Pinter 1995
- OECD: *Managing National Innovation Systems*. Organisation for Economic Co-Operation and Development, Paris 1999

- Nelson, R. N. 1993: National Systems of Innovation: A Comparative Analysis. New York: Oxford: Oxford University Press 1993

Topic 3 Knowledge Intensive Business Services

Topic outline:

- changing requirements towards competences of innovation managers and organization of innovation undertakings – needs for response by companies, RTOs and policy makers
- approaches towards making innovation activities sustainable

Main references/books/reading:

- Freeman, C.: Technology and Economic Performance: Lessons from Japan, Pinter, London. 1987
- Lundvall, B. A. (ed.): National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning. London, New York: Pinter 1995
- OECD: Managing National Innovation Systems. Organisation for Economic Co-Operation and Development, Paris 1999

Module 3 Regulation and financing of innovation

Topic 1 Innovation ecosystems

Topic outline:

- Incentives for innovation
- diffusion of innovations and consumer behavior

Main references/books/reading:

- Chapters 1 and 2 of A Cawson, L Haddon and I Miles, 1995, The Shape of Things to Consume
- Aldershot, Avebury available at website http://www.scribd.com/doc/3494210/Shape-of-Things-to-Consume-whole-text?in_collection=2290941 ans at: <http://analysees.co.uk/PDF/The-Shape-of-Things-to-Consume.pdf>
- Abernathy, W.J. and Utterback, J.M. (1978) Patterns of Innovation in Technology, Technology Review Vol. 80, No. 7, pp40-47
- Tushman, M.L. and P. Anderson (1986) "Technological discontinuities and organizational environments", Administrative Science Quarterly, 31, 439-65.
- Chapter 16 (Miles) in Jan Fagerberg, David Mowery, and Richard Nelson (eds) The Oxford Handbook of Innovation Oxford: Oxford University Press, 2004

Topic 2 Funding of STI

Topic outline:

- Methods of public funding of STI
- Public vs private funding of STI

Main references/books/reading:

- Dirk Czarnitzki, research and development in small and medium-sized enterprises: the role of financial constraints and public funding, *Scottish Journal of Political Economy*, Volume 53, Issue 3, pages 335–357, July 2006.
- Paul A. Davida, Bronwyn H. Hall, Andrew A. Toole, Is public R&D a complement or substitute for private R&D? A review of the econometric evidence, *Research Policy* Volume 29, Issues 4-5, April 2000, Pages 497-529

Topic 3 Public Services and Public Sector Innovation

Topic outline:

- service innovation in the public sector – e-government
- defense related innovation – specific case for public sector innovation

Main references/books/reading:

- Nagy K. Hanna. E-Transformation: Enabling New Development Strategies Innovation. Technology, and Knowledge Management, 2010. Available for downloading at <http://www.springerlink.com/content/p382517154572453/>
- ECOSOC (2006). Compendium of Innovative E-government Practices. Vol.II, Available for downloading at <http://unpan1.un.org/intradoc/groups/public/documents/un/unpan022196.pdf>
- Six Countries Programme. Linking Defence and Security R&D to Innovation: the challenge ahead. Summary report. November 2004. Available for downloading at http://www.6cp.net/downloads/04brussels_proceedings.pdf
- Judith Reppy. The Governance of Military R& D after the Cold War, in Science, Technology, and Governance, John De La Mothe, ed. (Continuum, 2001) (with Philip Gummett).
- Government ICT Strategy – Smarter, Cheaper, Greener”, January 2010, HM Government, United Kingdom. Section 4.2: “The Government Cloud or „G-Cloud?”, page 21.
- “Denmark as a High-speed Society – The High Speed Committee 2010”, January 2010, The High Speed Committee, National IT and Telecom Agency, Copenhagen, Denmark.

Topic 4 Capturing value from STI

Topic outline:

- complementary assets
- disruptive innovation
- dominant designs

Main references/books/reading:

- D Teece, 1986 , "Profiting from Technological Innovation," *Research Policy*, 15:6 pp 285-305.
- D Teece, 2006, "Reflections on 'Profiting from Innovation'", *Research Policy*, 35:8 pp 1131-1146
- Michael G. Jacobides et al., 2006, Benefiting from innovation: Value creation, value appropriation and the role of industry architectures, *Research Policy* Volume 35, Issue 8, Pages 1200-1221

Module 4 Current trends in STI

Public Private Partnerships for STI	
Digitalization of innovation	

Topic 1 Globalization of science and technology I /II

Topic outline:

- Global science communities
- Cross border cooperation vs regional efforts

Main references/books/reading:

- Hess, David J. *Alternative pathways in science and industry: Activism, innovation, and the environment in an era of globalization*. The MIT Press, 2007.
- Dunning, John H. "Multinational enterprises and the globalization of innovatory capacity." *Research policy* 23.1 (1994): 67-88.
- Edquist, Charles, and Leif Hommen, eds. *Small country innovation systems: globalization, change and policy in Asia and Europe*. Edward Elgar Publishing, 2008.
- Carter, Lyn. "Globalization and science education: The implications of science in the new economy." *Journal of Research in Science Teaching* 45.5 (2008): 617-633.

Topic 2 Public-Private Partnerships for STI

Topic outline:

- Public Private Partnerships (PPP) in the STI policy mix
- Taxonomy of PPPs

Main references/books/reading:

- Audretsch, David B.; Bozeman, Barry; Combs, Kathryn L.; Feldman, Maryann; Link, Albert N.; Siegel, Donald S.; Stephan, Paula; Tassej, Gregory; Wessner, Charles (2002b): *The Economics of Science and Technology*. *Journal of Technology Transfer*, Vol. 27: 155-203
- Audretsch, David B.; Link, Albert N.; Scott, John T. (2002a): *Public/Private Technology Partnerships: Evaluating SBIR-supported Research*. *Research Policy*, Vol. 31(1): 145-158
- Link, Albert N. (2006): *Public/Private Partnerships: Innovation Strategies and Policy Alternatives*. New York: Springer
- Link, Albert N.; Scott, John N. (2005): *Universities as Partners in U.S. Research Joint Ventures*. *Research Policy*, Vol. 34(3): 385-393
- OECD (2005a): *Public-Private Partnerships for Innovation: Synthesis Report*. Paris
- The Business and Industry Advisory Committee to the OECD (2003): *Promoting Better Public-Private Partnerships: Industry – University Relations*. BIAC 2003

Topic 3 Digitalization of Innovation

Topic outline:

- Open science
- open innovation
- Innovation Policies for System Transformation

Main references/books/reading:

- OECD (2015a), *The Innovation Imperative: contributing to productivity, growth and well-being*. OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264239814-en>.
- OECD 2015b, *System Innovation: Synthesis Report*. STI Policy Papers, OECD publishing.

- Coenen, L.m Hansen, T. & van Rekers, J. (2015), Innovation Policy for Grand Challenges. An Economic Geography Perspective. *Geography Compass*, Vol 9, no. 9, 483–496.
- Elzen, B., Geels, F. and Green, K. (2004), *System Innovation and the Transition to Sustainability: Theory, Evidence and Policy*. Edward Elgar Publishing
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