

Econ 771 &
871:
Economics of
Technological
Change

2019

**Presenter: Prof.
Rachel Jafta**



UNIVERSITEIT • IYUNIVESITHI • STELLENBOSCH • UNIVERSITY

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LECTURER

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Objectives and outcomes

Technological change in its many facets is central to an understanding of economic growth; yet, it was not always recognised as such. This module aims to study this key variable at the heart of the dynamics of industrial systems. The course will include theoretical as well as applied aspects, such as the determinants and consequences of technological innovation, its diffusion in the economic system, innovation strategies, the structure and dynamics of high technology industries, the role of institutions and national systems of innovation, and the importance of technological change for developing countries. The perspectives of both neoclassical and evolutionary economics will be studied.

Upon completion of the course, students should have a thorough understanding of the relationship between technological change and the dynamics and evolution of industries, firms' performance and growth and countries' competitive advantages.

Assessment

Assessment consists of class participation¹ (25%), formal essay (25%) and an examination (50%).



¹ See explanation in Box 1

MODULE CONTENT

SESSION	CONTENT	DATE
1.	<p>INTRODUCTION</p> <p>What is Economics of Technological Change and Evolutionary Economics and WHY does it matter?</p> <p>“Is Tech Disruption good for the economy?” [online: http://Stanford.io/2kaarjP]</p> <p>Athey, S and Luca, M, 2018. “Economists (and Economics) in Tech Companies”, HBS, Working Paper 19-027.</p> <p>Trajtenberg, M, 2018. “AI as the Next GPT: a political-economy Perspective, NBER Working paper 24245.</p> <p>Scenarios for class presentation + How do we read an academic paper?</p>	22/07
2.	<p>EVOLUTIONARY THEORY OF ECONOMIC CHANGE</p> <p>Nelson, Richard. R. 2017. “Economics from an evolutionary perspective”, LEM Working paper Series.</p> <p>Pianta, M, 2016. “Innovation and economic change”, <i>Economics of Innovation and New Technology</i>, https://doi.org/10.1080/10438599.2016.1257447.</p> <p>Evangelista, R, 2016. “Technology and Economics Development: The Schumpeterian Legacy”, <i>Review of radical Economics</i>, 2018, Vol. 50(1), pp. 136-153. DOI: 10.1177/04866134/6666565.</p>	29/07
3.	<p>THE FIRM, COMPETENCES AND INNOVATION</p> <p>*Dosi, G., Marengo, L. 2007. “On the Evolutionary and Behavioural Theories of Organizations: A Tentative Roadmap.” <i>Organization Science Perspective</i>, 18(3): 491-502.</p> <p>Teece, David. J. 2017. “A capability theory of the firm: an Economics and (strategic) management perspective”, New Zealand Economics Papers. [S]</p>	06/08
4.	<p>PRACTICAL CLASS</p>	13/08
5.	<p>NO LECTURE: GROUP WORK PREPARATION FOR PRESENTATION² 1</p>	20/08
6.	<p>NATIONAL SYSTEM OF INNOVATION VS INNOVATION IN SECTORS</p> <p>Vertova, G. 2014. “The state and National Systems of Innovation: a Sympathetic critique”, Levy Economics Institute, Bard College.</p>	27/08

² Questions for class presentation, based on **topics in this Module Framework** will be given out in lectures.

	*Malerba F. (2005). "Sectoral systems of innovation: a framework for linking innovation to the knowledge base, structure and dynamics of sectors", <i>Economics of Innovation and New Technologies</i> .	
7.	<p>INNOVATION AND INDUSTRIAL DYNAMICS</p> <p>*Malerba F. (2006). "Innovation and industry evolution", <i>Journal of Evolutionary Economics</i>.</p> <p>MODELLING INNOVATION AND INDUSTRY EVOLUTION: HISTORY FRIENDLY MODELS</p> <p>Garavaglia, C. 2010. Modelling Industrial Dynamics with History Friendly Simulations. <i>Structural Change and Economic Dynamics</i>, 21(4): 258-275.</p> <p>Landini, F, Lee, K, and Malerba, F, 2017. "A History-friendly model of the successive changes in industrial leadership and the catch-up by latecomers", <i>Research Policy</i> 46, pp.431-446 [S]</p> <p>Malerba, F and McKelvey, M, 2018. "Knowledge-intensive entrepreneurship integrating Schumpeter, evolutionary economics and innovation systems", <i>Small Business Economics</i>, Springer.</p>	03/09
8.	<p>PUBLIC POLICY FOR INNOVATION</p> <p>Foldvary, F E, Hammer, E J, 2016. "How advances in technology keep reducing interventionist policy rationales, <i>Technology in Society</i> 47, pp.16-24.[S]</p> <p>Edler, J and Fagerberg, J, 2017. <i>Innovation Policy: what, why, and how?</i>, <i>Oxford Review of Economic Policy</i>, Vol. 33(1), pp.2-23.</p> <p>SCIENCE AND TECHNOLOGY IN SOUTH AFRICAN CONTEXT</p> <p>RSA, 2018. Draft White Paper on Science and Technology. [available: https://www.gov.za/sites/default/files/gcis_document/201809/41909gon954.pdf]</p> <p>OC and C Strategy Consultants, 2018. Tech entrepreneurship ecosystem in South Africa, a study produced on commission for Google.</p>	17/09
9.	NO LECTURE; GROUP WORK FOR INNOVATION ROLE PLAY	01/10
10.	<p>TECHNOLOGY AND EMPLOYMENT</p> <p>Ugur, M, Mitra, A. 2017. Technology Adoption and Employment in Less Developed Countries: A Mixed-Method Systematic Review, <i>World Development</i> Vol.96, pp.1-18.</p>	08/10

Bogliacino, F., Pianta, M. 2010. Innovation and Employment: a Reinvestigation using Revised Pavitt classes, *Research Policy*, 39, pp.799-809.

Ernst, E, Merola, R and Samaan, D, 2018. "The economics of artificial intelligence: Implications for the future of work, ILO Research Paper

11.	PREPARATION FOR FINAL CLASS PRESENTATIONS	15/10
12.	FINAL STUDENT CLASS PRESENTATIONS	22/10

NOTE: Readings marked with an * should be prepared for learning in class, but are not included for examination purposes.



BOX 1: Preparation and Class participation

An introductory course such as this one covers a wide range of topics. Students are required to do the assigned reading before lectures. Compile a two page summary of the readings marked [**S**] for the particular section, focusing on the main questions the authors are trying to answer. Also, consider other issues they might have addressed, and relevant discussion points following from the literature. Each student is expected to hand the summary in at the beginning of lectures. Marks are allocated for these summaries.

During some sessions, students will be required to make formal class presentations. Marks will be allocated for individual performances, although preparation may take place in groups. The mark scored for the class presentations together with marks allocated for the summaries handed in, will contribute **25%** of your final mark.

BOX 2: FOR MASTERS STUDENTS [ECON 871]

In order to comply with the requirements for the senior degree, the following will apply to Masters Students:

- 1. Where summaries are due, their summaries should include insights from all the readings for that session;**
 - 2. Essays will be graded according to the standards for Masters degrees;**
 - 3. The final assessment (exam) will have a compulsory question earmarked for Masters Students in addition to the other options to choose from.**
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Assignment 2019

Topics: Choose **any one** of the following

- Artificial intelligence: a critical analysis of the threats and opportunities from an economic perspective
- Blockchain: possibilities for economic contributions beyond the cryptocurrency hype
- Technological change and job losses: was Schumpeter right?
- The Fourth Industrial Revolution: Possibilities and Pitfalls for developing Countries
- Social entrepreneurship and innovation: possibilities for sustainable development
- Saving the environment: nanotechnologies to the rescue?
- The economics of metaverses: technology and complex systems in a virtual world
- Sectoral patterns of innovation in the services sector
- The creative economy: fad or fact?
- Academic entrepreneurship: more hype than results?
- Schumpeter's legacy to the body of knowledge in Economics of Innovation: a summary
- Networks and innovation: a critical analysis of the notion that networks foster innovation.
- The economics of technology sharing: making sense of the open source movement.
- Technological change and employment: a fresh look at the evidence.
- Assessing the success of collaborative research programmes between the private sector and higher education institutions in a country of your choice.
- Diffusion of new technology: a summary of the theory and the implications for policy.
- Catching up through technology absorption: possibilities for developing countries.
- The state of science and technology in South Africa: an overview.
- Technology in neoclassical and evolutionary perspective: a comparison
- The National system of innovation approach: relevance for developing countries.
- Regional systems of innovation and the evolution of industries: an overview of the literature.
- Creative destruction in an industry (or sector) of your choice [a case study].
- Any topic of your choice (within the framework of the Economics of technological change); to be agreed with me.

• **Due date 30 September 2019**

• **Requirements:**

- **Length:** 8 pages, typed (1½ spacing, 12 pt font).

NOTE: The essay must comply with all the requirements of a formal academic essay.