

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

Институт статистических исследований и экономики знаний

**Программа дисциплины**

**«История технологического развития общества»**

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# **“The History of Technological Development in Society”**

**Program author: Thomas W. Thurner**

## **1. General Description of the Program**

The course is delivered to master students of the National Research University Higher School of Economics (HSE). It is delivered in one module. The course length is **114** academic hours in total of which **32** hours are class room hours for lectures and **82** hours are devoted to self study. Academic control form is one written exam.

### **Pre-requisites**

- Basics of management and innovation management
- Creative thinking

### **Themes:**

Humans interact with each other and the world through technology - that is the use of materials, energy, tools, and complex machines. Technology has been designed and created to serve human needs and desires. Also, though, technology has itself shaped human co-existence and societies and became a defining feature of human existence.

Starting from the Industrial Revolution at the end of the 18<sup>th</sup> century, this course discusses technology as the outcome of particular technical, historical, cultural, and political efforts in Europe, Russia and the US during the 19th and 20th centuries. The focus rests on societal consequences triggered through technological change and the influence of societal change to technological possibilities due to the bidirectional nature of this relationship.

The course discusses a number of historical examples of technological developments and societal changes, like the introduction of modern means of communication. It also analyzes the emergence of modern management and the creation and development of new professions.

### **Course objectives:**

- Studying episodes of technological and societal development in mechanization, communications, electronics, computers, power & energy, or military technology
- Familiarize students with concepts of “technological lock-in”, serendipity-effects and unintended consequences
- Discuss ethical and moral issues associated with technological choices

Though studying episodes of technological and societal development in mechanization, communications, electronics, computers, power & energy, or military technology, the student will study the interrelatedness of societal and technological processes. Also, the analysis will include how political, military, economic, social, and religious objectives have guided the design and use of technology. The course will also discuss the concept of “technological lock-in”, the importance of serendipity-effects and unintended consequences or ethical and moral issues associated with technological choices.

## 2. Thematic Plan

Module	Topic	Total academic hours	Lectures (class hours)	Self study
Industrial Revolution	The social, economic, geographic and technological environment	6	2	4
	The rise of new methods of production	6	2	4
	Cotton: the high-tech engine of growth	6	2	4
	Resources, energy, limits of growth and technology	6	2	4
	Urbanization and the Environment	6	2	4
Technology and War	Technology and War	6	2	4
Technology and accidents	Chernobyl, Challenger and Columbia	6	2	4
Communication and Globalization	Telephony – the individualization of communication	7	2	5
	Radio – the communication mass markets	7	2	5
	Internet and the rise of social networks	7	2	5
	Technology diffusion and Industrial Espionage	7	2	5
	From early main-frames to mobile devices	7	2	5
Computing	The software revolution and the rise of silicon valley	7	2	5
	Digital convergence	7	2	5
	The rise of the gaming industry	7	2	5
	Course review, synthesis	16	2	14
	<b>Total</b>	<b>114</b>	<b>32</b>	<b>82</b>

## 3. Education control forms

Final control (F): oral examination

**Summary Table: grading scale**

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

#### **4. Programme Contents**

##### ***Module 1 Industrial Revolution***

##### **Topic 1 The social, economic, geographic and technological environment**

###### Topic outline:

The importance of

- Social
- Economic
- Geographic and
- Technological variants are discussed

###### Main references/books/reading:

- Hobsbawm EJ (1999): *Industry and Empire: The Birth of the Industrial Revolution*, Penguin Group, pp 1-34.

##### **Topic 2 The rise of new methods of production**

###### Topic outline:

- Starting from medieval production method, the arrival of revolutionary production methods is discussed.

###### Main references/books/reading:

- Hobsbawm EJ (1999): *Industry and Empire: The Birth of the Industrial Revolution*, Penguin Group, pp 34-75.

##### **Topic 3 Cotton: the high-tech engine of growth**

###### Topic outline:

- raw materials and their massive influence on the production processes

###### Main references/books/reading:

- Hobsbawm EJ (1999): *Industry and Empire: The Birth of the Industrial Revolution*, Penguin Group, pp 75-102.

#### **Lecture 4: Resources, energy, limits of growth and technology**

##### Topic outline:

- changing patterns of resource utilization and consequent growth limits

##### Main references/books/reading:

- Hobsbawm EJ (1999): *Industry and Empire: The Birth of the Industrial Revolution*, Penguin Group, pp 102-317.

#### **Lecture 5: Urbanization and the Environment**

##### Topic outline:

- urbanization and consequences for the natural environment and agricultural production.

##### Main references/books/reading:

- Buckley at al. (2008), *Urbanization and Growth*, World Bank.

#### **Module 2      *Technology and War***

##### Topic outline:

- Meaning of technology for military use
- Dual use of technology

##### Main references/books/reading:

- Smith, Merritt Roe, ed. (1987): *Military Enterprise and Technological Change: Perspectives on the American Experience*. Cambridge, MA: MIT Press.
- Pick, Daniel (1996): *War Machine: The Rationalization of Slaughter in the Modern Age*. New Haven, CT: Yale University Press.

#### **Module 3      *Technology and Accidents***

##### Topic outline:

- Dangers of technologies

Main references/books/reading:

No reading required

## ***Module 4      Communication and Globalization***

### **Topic 1      Telephony – the individualization of communication**

Topic outline:

- individualization of communication and its consequences for societal development

Main references/books/reading:

- Standage T (1999): *The Victorian Internet: The Remarkable Story of the Telegraph and the Nineteenth Century's Online Pioneers*, The Berkeley publishing group

### **Topic 2 Radio – the communication mass markets**

Topic outline:

- development of Radio as a tool for mass market communication and its consequences for societal development

Main references/books/reading:

- Razlogova, E. (2012), *Listener's Voice: Early Radio and the American Public*, University of Pennsylvania Press, Inc.

### **Topic 3      Internet and the rise of social networks**

Topic outline:

- development Internet and the rise of social networks

Main references/books/reading:

- Birke, D. (2013), *Social Networks and Their Economics : Influencing Consumer Choice*, John Wiley & Sons
- Shome R, Hegde R (2002): *Culture, communication, and the challenge of globalization*, Critical Studies in Media Communication.

## **Topic 4      Technology diffusion and Industrial Espionage**

### Topic outline:

- technology diffusion and industrial espionage

### Main references/books/reading:

No reading required

## **Topic 5      From early main-frames to mobile devices**

### Topic outline:

- evolution of computing hardware

### Main references/books/reading:

- Castells M (2007): Communication, Power and Counter-power in the Network Society, International Journal of Communication.
- Stoneman P., Battisti G (2010): Chapter 17 – The Diffusion of New Technology, Handbook of the Economics of Innovation, Volume 2.

## **Topic 6      Computing**

### Topic outline:

- rise of the gaming industry and virtual realities

### Main references/books/reading:

- Brookey RA (2010): Hollywood gamers: digital convergence in the film and video game industries. University of Indiana Press.
- Hacklin F., Marxt C., Fahrni F. (2010): An evolutionary perspective on convergence: inducing a stage model of inter-industry innovation, International Journal of Technology Management.