Federal State Autonomous Educational Institution of Higher Education "Moscow Institute of Physics and Technology (National Research University)"

APPROVED
Vice Rector for Academic Affairs

A.A. Voronov

Work program of the course (training module)

course:	Global Trends and Methods for Strategic Development in the Era of Uncertainty/Глобальные тренды и методы стратегического развития в эпоху неопределенности
major:	Photonics and Optical Informatics
specialization:	Photonics, Quantum Technologies & 2D Materials/Фотоника, квантовые технологии и двумерные материалы
	Landau Phystech-School of Physics & Research
	Educational and scientific center for the humanities and social sciences
term:	1
qualification:	Master

Semester, form of interim assessment: 1 (fall) - Exam

Academic hours: 30 AH in total, including:
- lectures: 30 AH.
- seminars: 0 AH.
- laboratory practical: 0 AH.

Independent work: 30 AH.

Exam preparation: 30 AH.

In total: 90 AH, credits in total: 2

Number of course papers, tasks: 2

Author of the program: A.V. Eliseev, candidate of economic sciences

The program was discussed at the Educational and scientific center for the humanities and social sciences 09.06.2023

Annotation

Global trends and strategic analytics tools for working with the future in an era of uncertainty and complexity require a look through the lens of foresight and big data analytics. The events of recent years have clearly demonstrated the fragility of traditional forecasts and simple extrapolations: the future turned out to be nonlinear, incomprehensible and difficult to predict. We are seeing with our own eyes how the world is accelerating, the time for reaction and response is decreasing, digitalization is fundamentally changing almost all sectors of the economy, penetrating the life of society, threatening the existence of not only routine professions, but also those where the creativity and imagination of a person are primordially played a dominant role.

Global challenges, about which many people knew, but attributed their effects to long-term ones, began to appear literally before our eyes. We are witnessing a large-scale, fundamental transformation of markets, basic production and logistics technologies, demand for consumer properties of products and services, staff competencies and the quality of human capital. For example, climate change, the unfolding story of greenhouse gas emissions, the accelerated phase-out of plastic and oil and gas energy resources, the colossal transformation based on artificial intelligence and neural networks.

In these conditions, the imperative competitiveness of the country, the company, the readiness of each of us to change is the breadth of outlook when identifying trends, the willingness to look at them through different prisms and tools, the ability to form on their basis forks in which further development of the economy, science and society can go.

By combining tools for working with the future, it is possible not only to improve the accuracy of forecasts, but also to form a comprehensive system for monitoring and early detection of global challenges.

1. Study objective

Purpose of the course

To form students' understanding of the basics of global trends and methods for strategic planning the medium- and long-term innovative development of a company, industry, country in the face of growing uncertainty in foreign and domestic markets.

Tasks of the course

- To provide an overview of theoretical and practical approaches to global trends identification and their analysis;
- to provide an overview of theoretical and practical approaches to methods for strategic development, including quantitative and qualitative methods of foresight;
- to get students acquainted with key world’s cases of strategic planning and development at national, sectoral and corporate levels;
- to engage students in identification of global and local trend within business game organized by perspective science and technology directions.

2. List of the planned results of the course (training module), correlated with the planned results of the mastering the educational program

Mastering the discipline is aimed at the formation of the following competencies:

Code and the name of the competence	Competency indicators
UC-1 Use a systematic approach to critically analyze a problem and develop an action plan	UC-1.1 Systematically analyze the problem situation, identify its components and the relations between them
	UC-1.2 Search for solutions by using available sources
	UC-1.3 Develop a step-by-step strategy for achieving a goal, foresee the result of each step, evaluate the overall impact on the planned activity and its participants
UC-5 Analyze and consider cultural diversity in intercultural interactions	UC-5.1 Identify specific philosophical and scientific traditions in major world cultures
	UC-5.2 Define the theoretical and practical significance of cultural and linguistic factors within various interrelated philosophical and scientific traditions

UC-6 Determine priorities and ways to improve performance through self-assessment	UC-6.1 Achieve personal growth and professional development, determine priorities and ways to improve performance
	UC-6.2 Evaluate performance results in correlation with the set objectives and applied methods

3. List of the planned results of the course (training module)

As a result of studying the course the student should:

know:

- Landscape of global trends, including social, economic, science and technological, ecological;
- methods for strategic development, including quantitative and qualitative methods of foresight;
- ways of integration of strategic planning into organizational routines at national and corporate levels.

be able to:

- Identify global trends and drivers using different sources of materials;
- combine quantitative and qualitative methods of foresight;
- provide recommendations and suggestions for integration of strategic planning into organizational routines at national and corporate.

master:

- Tools for global trends identification and estimation their effects;
- key quantitative and qualitative methods of foresight;
- ability to integrate strategic planning into organizational routines at national and corporate levels.

4. Content of the course (training module), structured by topics (sections), indicating the number of allocated academic hours and types of training sessions

4.1. The sections of the course (training module) and the complexity of the types of training sessions

№	Topic (section) of the course	Types of training sessions, including independent work			
		Lectures	Seminars	Laboratory practical	Independent work
1	Global trends	8			10
2	Quantitative and qualitative methods of foresight	10			8
3	Integration of strategic planning into organizational routines at national and corporate levels	12			12
AH in total		30			30
Exam preparation		30 AH.			
Total complexity		90 AH., credits in total 2			

4.2. Content of the course (training module), structured by topics (sections)

Semester: 1 (Fall)

1. Global trends

Study of global trends presented in forecasts and foresights developed by international (UNIDO, UNESCO, OECD, IEA, FAO) and Russian organizations (NRU HSE). Identification of wild cards and weak signals. Overview of world foresight and forecasts, including China, EU, USA, Russia, S. Korea, and Japan.

2. Quantitative and qualitative methods of foresight

Overview of cases and characteristics of specific methods, including scanning, delphi, wild cards, citizen panels, expert panels, SWOT analysis, bibliometrics, modelling, literature review, patent analysis, extrapolation, brainstorming, scenarios.

3. Integration of strategic planning into organizational routines at national and corporate levels

Overview of cases and characteristics of integration of strategic planning into organizational routines at national level, including experience of Russia, Japan, China, EU. Overview of Russian experience of strategic planning and foresight, including national S&T Foresight 2030. Overview of cases and characteristics of integration of strategic planning into organizational routines at corporate level, including companies from automobile industries, aviation, oil and gas, energy, FMCG.

5. Description of the material and technical facilities that are necessary for the implementation of the educational process of the course (training module)

The implementation of academic discipline requires an audience of appropriate capacity. When lecturing, a marker or slate, chalk/markers, tables, charts are used. Technical training tools: computer with licensed software, multimedia projector.

6. List of the main and additional literature, that is necessary for the course (training module) mastering

Main literature

Рекомендуемая литература для самостоятельного изучения:

Машунин, Ю. К. Прогнозирование и планирование социально-экономических систем : учебник для вузов / Ю. К. Машунин. — Москва : Издательство Юрайт, 2023. — 330 с. — (Высшее образование). — ISBN 978-5-534-14698-1. — Текст : электронный

Additional literature

7. List of web resources that are necessary for the course (training module) mastering

International Monetary Fund World Economic Outlook https://www.imf.org/en/Publications/WEO/
World Economic Forum Dashboard https://intelligence.weforum.org/topics
Gartner Analytics technological insides https://www.gartner.com/smarterwithgartner
European Parliament Panel for the Future of Science and Technology
https://www.europarl.europa.eu/stoa/en/home/highlights
The Millennium Project https://www.millennium-project.org/

8. List of information technologies used for implementation of the educational process, including a list of software and information reference systems (if necessary)

Multimedia technology is used in lecture classes, including the demonstration of presentations.

9. Guidelines for students to master the course

While studying a student should independently replenish his knowledge and study the fundamental publications in subject area. Successful mastering of the course requires hard work of the student directly on lecture, and also independent work for assimilation of the passed material and the solution of the set of theoretical problems.

SUPPLEMENT

Assessment funds for course (training module)

major:	Photonics and Optical Informatics
specialization:	Photonics, Quantum Technologies & 2D Materials/Фотоника, квантовые технологии и двумерные материалы
	Landau Phystech-School of Physics & Research
	Educational and scientific center for the humanities and social sciences
term:	1
qualification:	Master

Semester, form of interim assessment: 1 (fall) - Exam

Author: A.V. Eliseev, candidate of economic sciences

1. Competencies formed during the process of studying the course

Code and the name of the competence	Competency indicators
UC-1 Use a systematic approach to critically analyze a problem and develop an action plan	UC-1.1 Systematically analyze the problem situation, identify its components and the relations between them
	UC-1.2 Search for solutions by using available sources
	UC-1.3 Develop a step-by-step strategy for achieving a goal, foresee the result of each step, evaluate the overall impact on the planned activity and its participants
UC-5 Analyze and consider cultural diversity in intercultural interactions	UC-5.1 Identify specific philosophical and scientific traditions in major world cultures
	UC-5.2 Define the theoretical and practical significance of cultural and linguistic factors within various interrelated philosophical and scientific traditions
UC-6 Determine priorities and ways to improve performance through self-assessment	UC-6.1 Achieve personal growth and professional development, determine priorities and ways to improve performance
	UC-6.2 Evaluate performance results in correlation with the set objectives and applied methods

2. Competency assessment indicators

As a result of studying the course the student should:

know:

- Landscape of global trends, including social, economic, science and technological, ecological;
- methods for strategic development, including quantitative and qualitative methods of foresight;
- ways of integration of strategic planning into organizational routines at national and corporate levels.

be able to:

- Identify global trends and drivers using different sources of materials;
- combine quantitative and qualitative methods of foresight;
- provide recommendations and suggestions for integration of strategic planning into organizational routines at national and corporate.

master:

- Tools for global trends identification and estimation their effects;
- key quantitative and qualitative methods of foresight;
- ability to integrate strategic planning into organizational routines at national and corporate levels.

3. List of typical control tasks used to evaluate knowledge and skills

In order to control the development of educational material by students, an oral survey is conducted at the beginning of the lesson on the topic of the last lesson.

4. Evaluation criteria

The control on the course is based on a working within groups. The final presentation of a group should reflect the input of every participant.

The topics for group could embrace the following problems.

1. Digital economy

2. New technologies
3. The role of AI
4. Future vision of industries
5. The role of human capital
6. Green economy
7. Smart city

Assessment “Excellent” (8-10): Has a clear argument, which addresses the topic and responds effectively to all aspects of the task. Fully satisfies all the requirements of the task; rare minor errors occur;

Assessment “Good” (5-7): Responds to most aspects of the topic with a clear, explicit argument. Covers the requirements of the task; may produce occasional errors.

Assessment “Satisfactory” (3-4): Generally addresses the task; the format may be inappropriate in places; display little evidence of (depending on the assignment): independent thought and critical judgment include a partial superficial coverage of the key issues, lack critical analysis, may make frequent errors.

Assessment “Fail” (0-2): Fails to demonstrate any appropriate knowledge on the topic discussed.

5. Methodological materials defining the procedures for the assessment of knowledge, skills, abilities and/or experience

Exam grade is granted on the basis of student’s individual working and group’s grade.