

Документ подписан
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**Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE
LUMUMBA
RUDN University**

ACADEMY OF ENGINEERING

educational division (faculty/institute/academy) as higher education program developer

COURSE SYLLABUS

Digital technologies of innovative production

course title

Recommended by the Didactic Council for the Education Field of:

27.04.05 Innovatics

field of studies / speciality code and title

The course instruction is implemented within the professional education program of higher education:

Digital transformation in production management

higher education program profile / specialization title

2025 year

1. THE PURPOSE OF MASTERING THE DISCIPLINE

The purpose of mastering the discipline is to gain knowledge, skills and experience in the field of digital technologies for innovative production, characterizing the stages of the formation of competencies and ensuring the achievement of the planned results of mastering the educational program.

The purpose of mastering the discipline is to acquire knowledge, skills and abilities in the field under study, characterizing the stages of competence formation and ensuring the achievement of the planned results of mastering the educational program.

2. REQUIREMENTS FOR THE RESULTS OF MASTERING THE DISCIPLINE

Mastering the discipline is aimed at developing the following competencies (parts of competencies) among students:

Table 2.1. The list of competencies formed by students in the course of mastering the discipline (the results of mastering the discipline)

Competency code	Name of competence	Competence achievement indicators (within this discipline)
GC-4	Able to apply modern communication technologies, including in a foreign language(s), for academic and professional interaction	UC-4.2. Uses modern information and communication tools for academic and professional interaction
GPC-7	Able to reasonably select and justify structural, algorithmic, technological and software solutions for managing innovative processes and projects, implement them in practice in relation to enterprise innovative systems, industry and regional innovative systems	GPC-7.1. Demonstrates knowledge of technological and software solutions for managing innovation processes
PC-3	Able to develop a plan and program for organizing innovative activities of a research and production unit, to carry out a feasibility study of innovative projects and programs	PC-3.2. Develops a plan and program for organizing innovation activities

3. THE PLACE OF DISCIPLINE IN THE STRUCTURE OF OP VO

The discipline refers to the mandatory part of the OP VO.

Within the higher education programme students also master other disciplines and internships that contribute to the achievement of the expected learning outcomes as results of the subject mastery.

Table 3.1. The list of components of the OP VO that contribute to the achievement of the planned results of the development of the discipline

Competency code	Name of competence	Previous disciplines, practices	Subsequent disciplines, practices
GC-4	Uses modern information and communication tools for academic and professional interaction	-	-
GPC-7	Demonstrates knowledge of technological and software solutions for managing innovation processes	Operational management of science-intensive industries Programming technologies for innovative industries Workshop on the application of Earth remote sensing data and geographic information systems	Design of automated control systems Organizational and managerial practice Preparation for passing and passing the state exam Implementation, preparation for the defense procedure and defense of the final qualification work
PC-3	Develops a plan and program for organizing innovation activities	Big data processing; Operational management of science-intensive industries Programming technologies for innovative industries	Strategic controlling in an innovative enterprise Organizational and managerial practice (U) Organizational and managerial practice (P) Undergraduate practice Preparation for passing and passing the state exam

		Implementation, preparation for the defense procedure and defense of the final qualification work
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4. VOLUME OF DISCIPLINE AND TYPES OF EDUCATIONAL WORK

The total complexity of the discipline is 6 credit units.

Table 4.1. Types of educational work by periods of development of OP VO

Type of study work		Total, academic hour	Semester 2
Contact work		48	48
Including:			
Lecture		16	16
Seminar classes		32	32
Independent work of the student		150	150
Control (test with assessment)		18	18
The total complexity of the discipline	Academic hours	216	216
	Credit Units	6	6

5. CONTENT OF THE DISCIPLINE

Table 5.1. The content of the discipline by type of educational work

Name of the discipline section	Contents of the section (topic)	Types of educational work
Section 1 Digital transformation of the economy	Topic 1.1. Digital economy: concept, goals and objectives Topic 1.2. Trends and prospects for the development of the digital economy	LEC, SM, IW
Section 2 Organizational foundations and structure of the digital economy	Topic 2.2. The structure of the digital economy Topic 2.3. Features of management and interaction in the digital economy	LEC, SM, IW
Section 3 Digital technologies	Topic 3.1. Industrial Internet. big data Topic 3.2. Components of robotics and sensors. Technologies of virtual and augmented reality Topic 3.3. Wireless communication technologies. Neurotechnology's and artificial intelligence Topic 3.4. New production technologies. Distributed ledger systems Topic 3.5. Cloud technologies. quantum technology	LEC, SM, IW
Section 4 internet energy	Topic 4.1. Conceptual model of the Internet of Energy Topic 4.2. Internet of Energy Architecture	LEC, SM, IW
Section 5 Industry 4.0 for the oil and gas industry	Topic 5.1. Digital transformation of the oil and gas industry Topic 5.2. Smart well/field concept	LEC, SM, IW
Section 6 Implementation and evaluation of the effectiveness of digital technologies	Topic 6.1. Life cycle of digitalization Topic 6.2. Assessment of the economic efficiency of the introduction of digital technologies Topic 6.3. Digital transformation assessment indices	LEC, SM, IW
Section 7 The experience of foreign countries in the development of the digital economy in the energy sector	Topic 7.1. The experience of the US and the EU in the development of the digital economy in the energy sector Topic 7.2. The experience of Asian countries in the development of the digital economy in the energy sector	LEC, SM, IW

* LEC - lecture, SM - seminars; IW - independent work

6. LOGISTICS AND TECHNICAL SUPPORT OF THE DISCIPLINE

Table 6.1. Logistics of discipline

Types of Auditorium	Audience equipment	Specialized educational / laboratory equipment, software and materials for mastering the discipline (if necessary)
Lecture	An auditorium for lecture-type classes, equipped with a set of specialized furniture; board (screen) and technical means of multimedia presentations	
Seminar	An auditorium for conducting seminar-type classes, group and individual consultations, current control and intermediate certification, equipped with a set of specialized furniture and technical means for multimedia presentations	
For independent work of students	An auditorium for independent work of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to EIOS	

7. EDUCATIONAL-METHODOLOGICAL AND INFORMATION SUPPORT OF THE DISCIPLINE

Main literature:

1. Минбалеев А.В., Мартынов А.В., Камалова Г.Г. [и др.] Механизмы и модели регулирования цифровых технологий: монография / Электронные текстовые данные. М.: Проспект, 2022. 263 с. ISBN 978-5-392-35635-5.
2. Данилюк А.Я., Кондаков А.М. Концепция Базовой модели цифровой экономики / М.: РУДН. 2018. <https://www.mgpru.ru/wp-content/uploads/2021/01/Spisok-nauchnyh-trudov-Kondakova-Aleksandra-Mihajlovicha.pdf>
3. Быков А.Ю. Система нормативно-правовой базы цифровой экономики Российской Федерации / М.: Проспект. 2017. https://www.google.com/search?sca_esv=d143a126214438bd&sxsrf=ACQVn08H
4. Граничин О.Н., Кияев В.И. Информационные технологии в управлении / М.: ИНТУИТ.ру.2008. <https://www.iprbookshop.ru/133941.html?replacement=1>
5. Еремин Н.А. Управление разработкой интеллектуальных месторождений нефти и газа / М.: РГУ нефти и газа им. И.М. Губкина. 2011.
6. Косиненко Н.С., Фризен И.Г. Информационные системы и технологии в экономике / М.: Дашков и К. 2015. <https://studfile.net/preview/16876099/page:26/>
7. Крутиков В.К. Цифровая экономика: проблемы и возможности: монография / Калуга: Политоп. 2018. <https://www.google.com/search?q=8.+%D0%9A%D1%80%D1%83%sourceid=chrome&ie=UTF-8>

Additional literature:

1. Авдеева И.Л. Теория и методология глобального управления в условиях цифровой экономики: монография / Орёл: ОГУ имени И.С. Тургенева. 2017.
2. Балдин К.В., Воробьев С.Н., Уткин В.Б. Управленческие решения: учебник / М.: Дашков и К. 2006.
3. Вайл П., Ворнер С. Цифровая трансформация бизнеса: изменение бизнес-модели для организации нового поколения / М.: Альпина паблишер. 2019.
4. Воронина И. Бизнес-симуляция vs бизнес-анимация / EduTech. Информационно-аналитический бюллетень КУ Сбербанка. 2017. № 1 (4). С.15-17.
5. Карп Н. Великий переход. Революция облачных технологий / М.: Манн, Иванов и Фербер 2015. <https://www.google.com/search?q=5.%09%D0%9A%80=gws-wiz-ser>.

The electronic library system (ELS) of RUDN University and third-party EBS, to which university students have access on the basis of concluded contracts:

- ELS RUDN <http://lib.rudn.ru/MegaPro/Web>
- ELS «University Library Online» <http://www.biblioclub.ru>
- ELS Юпайт <http://www.biblio-online.ru>

- ELS «Student Advisor» www.studentlibrary.ru
- ELS «Троицкий мост»

Databases and browsers:

- Electronic fund of legal and normative-technical documentation <http://docs.cntd.ru/>
- Yandex search <https://www.yandex.ru/>
- Google search <https://www.google.ru/>
- Abstract database SCOPUS <http://www.elsevierscience.ru/products/scopus/>

Educational and teaching materials for independent work of students in the course of mastering the discipline:*

A course of lectures on the discipline.

* all educational and teaching materials for independent work of students are placed in accordance with the current procedure on the discipline page in the telecommunication educational in-formation system (TEIS) of RUDN

8. EVALUATION MATERIALS AND SCORE-RATING SYSTEM FOR ASSESSING THE LEVEL OF FORMATION OF COMPETENCES IN THE DISCIPLINE

Evaluation materials and a point-rating system for assessing the level of formation of competencies (parts of competencies) based on the results of mastering the discipline are presented in the Appendix to this Work Program of the discipline.

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