



APPROVED

Vice-rector for educational activities

Veronika.G. Shubaeva

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Digital Business Transformation/ Цифровая трансформация бизнеса

Syllabus of the course

Specialty	38.03.02 Management
Specialization	Business management and digital innovations
Level of higher education	Bachelor
Form of training	Full-time
Year of enrolment	2023

Authored by:

PhD, Titova Alexandra Viktorovna

Total number of hours	108	Form of final attestation: Test: semester 5
incl:		
contact work	32	
self-study	76	
practical training	0	
control hours	0	

Hours distribution:

Semester:	5
Type of classes	Hours
Contact hours	18
Practical training	14
Laboratory work	
Total contact hours	32
Self-study	76
Control hours	0
Total academic hours	108
Total credits	3

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1. LEARNING OBJECTIVES

Objective:	Formation of a system of fundamental knowledge, skills and abilities in the field of digital technologies among students, which ensure the process of making managerial decisions in modern conditions and the practical use of the acquired knowledge, skills and abilities in developing a strategy and tactics for introducing digital technologies into the activities of an enterprise.
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2. COURSE PLACE IN THE PROGRAMME STRUCTURE

The discipline B1.V. Digital Business Transformation is a part of Block 1.

3. EXPECTED LEARNING OUTCOMES

Code and name of graduate competence	Code and name of the competence achievement indicator	Expected learning outcomes
PC-7 – Defining a strategy and policy for the development and maintenance of a business digitalization management system	PC-7.1 – Demonstrates the ability to solve design and economic problems in professional activities, including using information and analytical systems	<p>To know: principles of functioning of digital technologies; structure and functionality of the main tools for digitalization of management; the main stages and processes accompanying the introduction of digital technologies in management.</p> <p>To be able to: analyze alternative strategies and tactics in the field of digitalization of management decision-making systems; identify the possibilities of digital technologies in achieving the business goals of the enterprise; manage the process of development and implementation of digital technologies in the management decision-making system.</p> <p>To master: digital technologies for collecting, processing, storing and transmitting information; methods for generating a list of requirements and choosing digital tools and their integration in order to automate management decision-making; project management methods in the field of digitalization of management decision-making systems.</p>

4. COURSE STRUCTURE AND CONTENT

Code and name of the topics	Course content	Academic hours			
		Contact work			Self-study
		Lectures	Practices	Workshops	
Topic 1. Digital transformation of industry.	Industrial revolutions. History of informatization. Key aspects of the fourth industrial revolution. The concept of digitalization and its features. Changes in social,	2			4

Introduction.	consumer and business models in the context of digitalization. Nine components of the fourth industrial revolution in the prism of influence on the processes of organization of production.				
Topic 2. Stages of maturity of an organization on the way to digitalization.	Stages of informatization in the prism of development of business models. Stages of maturity of the organization on the way to digitalization. Information systems of the third industrial revolution (ERP, MOM, MES, CRM). Fundamentals of information systems integration. Types of interaction of information systems. Interaction in real time. Features and supporting tools.	2	2		10
Topic 3. Strategies for digital business transformation.	Methods for determining the stage of maturity of the organization. Matrices used in the analysis of the organization's position on the path to digitalization. Digitalization strategy in the strategic map of the enterprise. Benefits, costs and risks of digital business transformation. General approaches to planning a digitalization project.	2			6
Topic 4. Digital lean manufacturing.	Components of Lean Manufacturing. The concept of digital lean manufacturing. Digital technologies in lean manufacturing and key success factors. The results of the implementation of digital lean manufacturing. Three main strategies for implementing digital lean manufacturing (depending on the degree of implementation of digital technologies and lean manufacturing tools).	2			10
Topic 5. Big Data in the digital transformation of the enterprise.	The concept of Big Data. Features of Big Data. Multidimensionality of Big Data. Requirements for operations performed using Big Data. Storage of Big Data. NOSQL databases. Distributed Computing. Options for organizing storage of Big Data. Data centers. Cloud and peripheral technologies in the organization of storage and computing. Data transmission, networks of mobile operators, long-range and short-range, satellite coverage.	2	4		12
Topic 6. Methods of data analysis in the context of digitalization.	Big Data Processing Methods. The concept of Data Science and Data Analytics. Basic methods of Big Data analysis. Cross-industry standard data mining process. Artificial intelligence in data analysis. Machine learning methods. Typical tasks of machine learning in ensuring the digital transformation of an enterprise. Problems of regression, classification, clustering, search for rules, dimensionality reduction. General concept of deep machine learning and scope in industry.	2	4		12
Topic 7. Industrial Internet of Things technology.	The concept of the Internet of things. The history of the term. Industrial Internet of Things. Components of the industrial Internet of things, the general conceptual scheme of the Internet of things. Cost and benefit factors in the Internet of Things. Sensors and actuators. Economic, organizational, technological challenges in the implementation of the Internet of things. Product examples in the IoT market (AWS Greengrass, AWS IoT SiteWise, Industrial Center Condition Monitoring, and Microsoft Azure Predictive Maintenance). Legal aspects of the implementation of the Internet of things.	2	2		8
Topic 8. Digital twins in the transformation of	The concept of a digital twin and the algorithm of its operation. Automatic collaboration methods available in digital twins. Concept of digital shadow and digital	2	2		8

industry.	enterprise thread. Types and types of digital twins. The digital twin of the product. The digital twin of the manufacturing process. The digital twin of the environment. Digital twin of operation. The impact of digital twins on the design of new products. Stages of creating a digital twin of an enterprise. Examples of successful implementation of digital twins.				
Topic 9. Technologies of the fourth industrial revolution in the digitalization of an industrial enterprise.	Nine components of digitalization. The results of the introduction of digital technologies in the activities of organizations, the expected and real benefits. Technologies of virtual and augmented reality in production. Additive technologies in production. Robotics in production. Classification of production robots. Modern aspects of cyber security. Prospects for the development of digital technologies.	2			6
Control hours:					0
Total hours:		18	14	0	76

5. TEACHING AND LEARNING TOOLS OF THE COURSE

5.1 Recommended literature

Bibliographic description of the publication (author, title, type, place and year of publication, number of pages)	Digital resources
Designing information systems: a textbook and workshop for secondary vocational education / D. V. Chistov, P. P. Melnikov, A. V. Zolotaryuk, N. B. Nicheporuk; under the general editorship of D. V. Chistov. - Moscow: Yurayt Publishing House, 2021. - 258 p. - (Professional education). - ISBN 978-5-534-03173-7. - Text: electronic // EBS Yurayt [website]. — URL: https://urait.ru/bcode/471492 (date of access: 08/05/2021).	https://urait.ru/bcode/471492
Sergeev, L. I. Digital economy: a textbook for universities / L. I. Sergeev, A. L. Yudanov; edited by L. I. Sergeev. - Moscow: Yurayt Publishing House, 2022. - 332 p. - (Higher education). - ISBN 978-5-534-13619-7. — Text: electronic // Educational platform Urayt [website]. — URL: https://urait.ru/bcode/497448 (date of access: 11/21/2022).	https://urait.ru/bcode/497448
Sologubova, G.S. Components of digital transformation: monograph / G.S. Sologubova. - Moscow: Yurayt Publishing House, 2022. - 147 p. — (Actual monographs). - ISBN 978-5-534-11335-8. — Text: electronic // Educational platform Urayt [website]. — URL: https://urait.ru/bcode/494769 (date of access: 11/21/2022).	https://urait.ru/bcode/494769

5.2 List of software (including national production)

- 7-Zip
- LibreOffice
- ОС АЛЪТ образование 10
- Jupyter Notebook

5.3 List of reference systems and modern professional databases

№	Name of reference systems and professional databases
1.	Digital library Grebennikon.ru – www.grebennikon.ru
2.	Science Digital Library eLIBRARY – www.elibrary.ru
3.	Science Digital Library КиберЛеника – www.cyberleninka.ru
4.	Database ПОЛПРЕД Справочники – www.polpred.com
5.	Database OECD Books, Papers & Statistics on the platform OECD iLibrary www.oecd-ilibrary.org
6.	Legal reference system КонсультантПлюс (installed resource UNECON or www.consultant.ru)
7.	Legal reference system «ГАРАНТ» (installed resource UNECON or www.garant.ru)
8.	Information and referral system «Кодекс» (installed resource UNECON or www.kodeks.ru)
9.	Digital library system BOOK.ru - www.book.ru
10.	Digital library system ЭБС ЮРАЙТ – www.urait.ru
11.	Digital library system ЗНАНИУМ (ZNANIUM) – www.znanium.com
12.	Digital library UNECON – opac.unecon.ru

6. TECHNICAL FACILITIES

There are special rooms for lectures, seminars, coursework, group and individual consultations, current and interim assessments, as well as rooms for self-study.

The premises are equipped with equipment and teaching aids.

The rooms for students' independent work are equipped with computers with Internet connection and access to the university's electronic learning environment.

Name of classroom	Classroom location
Classroom 2021 Laboratory "Laboratory complex" Specialized furniture and equipment: Educational furniture for 22 seats (22 computer tables, 22 black chairs) Educational furniture for 42 seats (21 desks), teacher's workplace (computer table 1 pc.) board, chalk 3-section 1 pc., marker board on wheels 1 pc., clock 1 pc., pulpit 1 pc., table 1 pc., bedside table 1 pc., chair from 4 pcs., rack hanger 2 pcs., blinds 3 pcs. Computer i5-8400/8GB/500GB_SSD/Viewsonic VA2410-mh - 23 pcs., Installation of demonstration training films - 1 pc., Computer included system unit Intel pentium x2 g3250 keyboard+mouse L (500gb hard drive, philips monitor 21.5') - 1 PC. Sets of demonstration equipment and visual aids: multimedia applications for lecture courses and practical exercises, interactive educational visual aids.	191023, St. Petersburg, Griboedova canal, 30-32, lit. A, Б, P
Classroom 3024 Laboratory of the Department of Banks, Financial Markets and Insurance. Specialized furniture and equipment: Educational furniture for 26 seats (13 tables, 26 chairs), teacher's workplace, marker board on wheels 1, table 1, chair 1, book 3 cabinets, 3 bookcases with mezzanines, 2 cabinets, 1 rack hanger, 1 bulletin board. IP Cisco IP Phone 7911G - 1 pc. Portable multimedia kit: Notebook HP 250 G6 1WY58EA, Multimedia projector LG PF1500G. Sets of demonstration equipment and visual aids: multimedia applications for lecture courses and practical exercises, interactive educational visual aids.	191023, St. Petersburg, Griboedova canal, 30-32, lit. A, Б, P
Classroom 2026 Computer class (for conducting practical classes, course design (performing term papers) using computer technology). Equipped with a multimedia complex. Specialized furniture and equipment: Educational furniture for 25 seats, teacher's workplace (table - 2 pcs., chair - 1 pc.), 3-section marker board - 1 pc., rack	191023, St. Petersburg, Griboedova canal, 30-32, lit. A, Б, P

hangers - 2 pcs. , ISO chair - 9 pcs., blinds - 2 pcs., Computer pentium x2 g3250 /8Gb/500gb/ philips 21.5') - 1 pc., Computer Intel X2 G3420/8 Gb/500 HDD/PHILIPS 200V4 - 23 pcs., Notebook HP 250 G6 1WY58EA - 2 pcs., Multimedia projector Optoma x 400 - 1 pc. Sets of demonstration equipment and visual aids: multimedia applications for lecture courses and practical exercises, interactive educational visual aids.	
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7. METHODOLOGICAL GUIDELINES FOR STUDENTS

The following documents should be made available to the trainee before the start of the course:

- training and methodological documentation;
- local normative acts regulating the main issues of the organisation and implementation of educational activities, including those regulating the procedure for current monitoring and interim assessment of students;
- the schedule of consultations of the teaching staff.

The level and depth of mastering the discipline is determined by the active and systematic work of students in lectures, seminars, independent work, including in terms of identifying the most significant and relevant problems for further study. A special condition for qualitative mastering of the discipline is an effective organisation of work, which allows distributing the academic workload evenly in accordance with the schedule of the educational process.

When preparing for classes, students have the opportunity to attend consultations with the staff of UNECON according to the timetable set out in the schedule of consultations.

The students' in- and out-of-classroom work should aim to form:

- the fundamentals of the learner's world view and scientific understanding;
- basic knowledge relevant to the training area and the declared professional field, forming the target and professional basis for training;
- professional competences oriented towards the needs of the labour market;
- an individual trajectory by mastering a unique set of professional competences that complement the learner's competence model, through a focus on specific professional specialised areas of knowledge defined by labour market representatives;
- meta-skills for learners, such as teamwork and leadership, data analysis, digital skills, project design and implementation, intercultural interaction.

8. SPECIFICATIONS FOR TEACHING DISABLED PERSONS

Students with disabilities, if necessary, are taught on the basis of an adapted work programme using special teaching methods and didactic materials that take into account the particularities of their psychophysical development, individual capacities and health status.

In order for disabled persons and persons with disabilities to master the curriculum, the University shall ensure that:

- for the visually impaired and visually impaired: availability of information on the timetable in accessible places and adapted forms for learners who are blind or visually impaired; presence of an assistant to assist the learner as needed; production of alternative formats of teaching materials (large print or audio files);

- for the hearing-impaired and hearing-impaired: adequate sound reproduction of information;

- for persons with disabilities and persons with mobility impairments: the possibility of unimpeded access for students to classrooms, restrooms and other areas of the department, as well as their stay in these areas.

Learners with disabilities and persons with disabilities are provided with printed and/or electronic educational resources in forms adapted to their disabilities. The education of students with disabilities may be organised with other students or in separate groups or organisations.

ASSESSMENT RESOURCES

1.1 Control tasks and assignments for interim attestation

Is not provided by the work programme of the discipline.

1.2 Topics for written task

Is not provided by the work programme of the discipline.

1.3 Interim checkpoints

Number	Type	Method of conduct	Topic number
1	Case task	with the help of technical means and information systems	1-4
2	Control testing	with the help of technical means and information systems	4-6
3	Monitoring	with the help of technical means and information systems	1-9

1.4 Other assessment objects

Is not provided by the work programme of the discipline.

1.5 Self-study

Name of self-study	Topic number
Preparation for lectures and practical classes	1-9
Preparation of messages, reports	4,7,8
Performance of calculation, analytical, settlement-graphic and other tasks	5,6
Essay writing	1,2

1.6 Grading scale

Scales of assessment and procedures for assessing learning outcomes of the discipline are regulated by the Regulations on the current control of progress and interim attestation of students in higher education programmes and the Regulations on the scoring and rating system.

A grading and rating system is used to assess the learning outcomes of the discipline:

The final control of the discipline is an examination (or a differentiated test), the final grade being formed in accordance with the scale given in the table below:

Points	Grade
<55	Not passed
>=55	Passed

Grading scale

2 (points to 54)	Demonstrates a lack of understanding of the problem. Many of the requirements of the assignment are not met. An initial perception of the material is demonstrated. The work is incomplete and/or plagiarised.
3 (points 55-69)	Demonstrates a partial understanding of the problem. Most of the requirements of the task have been met. Mastery of the elements of the assigned material. The material is mostly clear and coherent.
4 (points 70-84)	Demonstrates considerable understanding of the issue by the discipline. All requirements of the assignment are fulfilled. The content of the completed tasks is disclosed and examined from different perspectives.
5 (points 85-100)	Demonstrates full understanding of the problem. All requirements of the assignment are fulfilled. Demonstrates proficiency in the discipline. The completed assignments are holistic, complete, structured, present different points of view and demonstrate creativity.