



APPROVED

Vice-rector for educational activities

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Цифровые технологии и средства работы с данными / Digital technologies

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:

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Total number of hours	108	Form of final attestation: Test: semester 4
incl:		
contact work	32	
self-study	76	
practical training	0	
control hours	0	

Hours distribution:

Semester:	4
Type of classes	Hours
Contact hours	4
Practical training	28
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:	The study of the basic principles of the use of information technology in solving practical problems; formation of bachelors' skills of algorithmization of computational processes; creation of the necessary basis for the use of modern computer technology and application packages in the study by students of the disciplines of the curriculum during the entire period of study.
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2. COURSE PLACE IN THE PROGRAMME STRUCTURE

The discipline B1.O.DV. Digital technologies 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
GPC-5 – Able to use modern information technologies and software in solving professional problems, including the management of large data arrays and their intellectual analysis	GPC-5.3 – Understands the features of the technologies of the 4th industrial revolution and the possibility of their use in the design of business models of organizations	<p>To know: features of technologies of the 4th industrial revolution and the possibility of their use in the design of business models of organizations</p> <p>To be able to: apply specialized software products when designing business models of organizations</p> <p>To master: the skills of forming business models of organizations using modern technologies</p>
GPC-6 – Able to understand the principles of operation of modern information technologies and use them to solve the problems of professional activity	GPC-6.2 – Uses methods and software for data collection, processing and analysis	<p>To know: principles of data storage and processing in databases; classification of databases by structure, principles of presentation of information of various types; software design methods and tools</p> <p>To be able to: choose the best means of solving problems, minimize solutions, present the result; to model business processes in specialized software packages, to develop components of software systems for the Internet environment</p> <p>To master: the skills of formulating and analyzing the results of queries to databases; methods and tools for describing processes, methods and tools for modeling processes, programming skills for the Internet environment</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. National programs for the digitalization of the Russian economy.	National goals and strategic objectives of the development of the Russian Federation for the period up to 2024. National project (program) "Digital economy". Federal projects "Digital Technologies" and "Information Security".	1			9
Topic 2. Distributed registries. Blockchain technologies. Cryptocurrencies. Virtualization methods and technology containers.	Distributed registries. Using a distributed ledger. Blockchain technologies, virtualization and containerization technologies. Characteristics of distributed systems, their types and types, schemes for building blockchain systems, security issues of such systems, development of cryptocurrency technologies. Methods for building flexible and adaptive information infrastructures based on virtualization and container technologies.	1			9
Topic 3. Modeling as a method of cognition. Digital modeling technologies.	Concepts and essence of modeling in the process of cognition. The role and place of modeling methods in the process of obtaining relevant knowledge, the need for which arises in economic systems. Classification features of models and types of models belonging to classes in accordance with the features used in a particular subject area. Forms of representation of models that allow you to verify models depending on the goals, objectives, objects and subjects of research and knowledge production. The essence of deterministic, stochastic and game modeling methods. Information systems that implement technologies for modeling economic processes, their features, areas of application, efficiency. Notations for modeling business processes, rules for creating models based on them, information technologies for implementing such models, software for implementing models. Approach to the physical implementation of information systems based on such models, information technology and case tools.	1			9
Topic 4. Information security: technological aspects and processes of information protection.	Information technology (IT) and systems (IS) security. New forms of state and economic management of the economy in Russia in the face of scarcity and inconsistency of the legal framework. The main issues of integrated information security, a description of the concept and program of state and corporate information security, methods, mechanisms and tools for building an effective information security system of a modern high-tech organization.	1			9
Topic 5. Database management in spreadsheets: advanced level.	Creation and maintenance of the database in MS Excel. Sorting database records. Using filters for database analysis. Using functions for database analysis.		8		9

Topic 6. Business process management information systems (BPMS): basic level.	Basic elements and principles of creating models. Principles of development of models of business processes. Features of BPMN notation in business process modeling. Basic elements of BPMN notation.		4		11
Topic 7. Modeling business processes in BPMN 2.0 notation: Development of a business process model.	Learning the interface and basics of working with the BizAgi Process Modeler software product. The main elements and their application in the development of business process models: pool, lane, event, task, gateway, etc. Development of a training example and building a business process model for registering and processing an online store application.		4		11
Topic 8. Tools for developing Web services.	Overview and practical use of web services to create a personal website or blog. Review and practical use of online disks. Overview and practical use of online learning services. Overview and practical use of banking and government web services. Overview and practical use of services for working with images.		12		9
Control hours:					0
Total hours:		4	28	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
Information systems and technologies in economics and management in 2 hours. Part 1: Textbook / otv. ed. Trofimov V.V. - 5th ed., trans. and additional .- Electron. Dan. - Moscow: Yurayt Publishing House, 2019 .- 375 p.	https://urait.ru/viewer/inform...i-v-2-ch-chast-1-441968#page/1
Information systems and technologies in economics and management in 2 hours. Part 2: Textbook / otv. ed. Trofimov V.V. - 5th ed., trans. and additional .- Electron. Dan. - Moscow: Yurayt Publishing House, 2019 .- 324 p.	https://urait.ru/viewer/inform...ravlenii-v-2-ch-chast-2-441969
Information technologies for data processing and analysis in Microsoft Excel 2013: study guide / E.A. Osipova [et al.] .- St. Petersburg: St. Petersburg State University of Economics, 2017 .- 119 p.- Among the authors: O.M. Smetkina, D.Yu. Sokolova, A.S. Rashchupkina .— Information is also available on the Internet: opac.unecon.ru.	http://opac.unecon.ru/elibrary...B1%D0%BE%D1%82%D0%BA%D0%B8.pdf

5.2 List of software (including national production)

- 7-Zip
- ОС АЛТ образование 10
- LibreOffice
- draw.io
- diagrams.net

- LibreOffice Calc
- LibreOffice Writer

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 2014 Training classroom (for conducting lecture-type classes and seminar-type classes, course design (term papers), group and individual consultations, current control and intermediate certification) is equipped with a multimedia complex. Specialized furniture and equipment: Educational furniture for 56 seats (training table 28 pcs. chairs 56 pcs.), teacher's workplace, table m / m, chalk board 2 pcs. (single section), chair 1 pc., chair 1 pc. Computer Intel i3-2100 2.4 Ghz /4Gb/500Gb/Acer V193 19" - 1 pc., Multimedia projector Optoma x 400 - 1 pc., Screen with electric drive, DRAPER 96 160x210 - 1 set 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, B, P
Classroom 2020 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, marker board on wheels 2 pcs, table 1 pc, chair 6 pcs, blinds 2 pcs, rack hanger 2 pcs. Computer Intel I5-7400/ 16Gb/1Tb/ video card NVIDIA GeForce GT 710/Monitor DELL S2218H - 25 pcs., Telecommunication wall cabinet CMO ShRN-E-6.650 - 1 pc., Switch ProCurve Switch 2626 - 1 pc., Multimedia	191023, St. Petersburg, Griboedova canal, 30-32, lit. A, B, P

projector Optoma x 400 - 1 pc. ., Spring-loaded manual screen MW Cinerollo 200x200cm (S/N) - 1 pc. Sets of demonstration equipment and visual aids: multimedia applications for lecture courses and practical exercises, interactive educational visual aids.	
Classroom 2028 Training classroom (for lecture- and seminar-type classes, coursework, group and individual consultations, current control and intermediate attestation), equipped with a multimedia system. Specialized furniture and equipment: Educational furniture for 44 seats, teacher's workplace, chalk board (one section) - 1 pc, chair - 1 pc, table - 1 pc, chair - 3 pcs. Portable multimedia set: HP 250 G6 1WY58EA laptop, LG PF1500G multimedia projector. Sets of display equipment and visual aids: multimedia applications for lecture courses and practical sessions, interactive teaching and visual aids.	191023, St. Petersburg, Griboedova canal, 30-32, lit. A, B, P

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	Individual task	with the help of technical means and information systems	6-7
2	Individual task	with the help of technical means and information systems	8
3	Monitoring	with the help of technical means and information systems	1-8

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
Doing homework	1-8
Preparation for lectures and practical classes	1-8

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.