Federal State Autonomous Educational Institution for Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
(RUDN University)
Faculty of Economics

COURSE SYLLABUS

GEOGRAPHIC INFORMATION SYSTEMS: VISUALIZATION OF SPATIAL DATA

Recommended by the Didactic Council for the Education Field of

38.03.01 Economics

(code and name of the direction of training/specialty)

The development of the discipline is carried out within the framework of the implementation of the main professional educational program of higher education:

Accounting, Analysis and Audit, International Economic Relations and Foreign Economic Activity, World Economy, General Profile, Project Analysis and Modeling in Economics, Insurance, Finance and Credit, Digital Economy, City Economy, Enterprise Economy and Entrepreneurship, Business Management, Marketing, Human Resources Management, Production Management

2024

1. COURSE GOALS

The purpose of mastering the discipline "Geoinformation systems: visualization of spatial data" is to master modern visualization of spatial data using geoinformation systems and gain skills in self-creation of maps for a comprehensive analysis of the phenomena under study.

2. LEARNING OUTCOMES

Mastering the discipline "Geoinformation systems: visualization of spatial data" is aimed at the formation of the following competencies (parts of competencies) in students:

Table 2.1. List of competencies formed by students during the development of the discipline (results of the development of the discipline)

Competence code	Competence	Competence indicators
GC-12	Able to: search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data received from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions based on incoming information and data	GC-12 Know how to search for the necessary sources of information and data, perceives, analyzes, memorizes and transmits information using digital means, as well as using algorithms when working with data received from various sources in order to effectively use the information received to solve problems
		GC-12 Able yo evaluate information, its reliability, builds logical conclusions based on incoming information and data

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The discipline "Geoinformation systems: visualization of spatial data" refers to the part formed by the participants of the educational relations of the block Б1.В.ДВ.05.02.

Within the framework of the educational program, students also master other disciplines and/or practices that contribute to achieving the planned results of mastering the discipline "Geoinformation systems: visualization of spatial data".

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

Code	Competence	Previous disciplines/modules, practices*	Subsequent disciplines/modules, practices*
GC-12	Able to: search for the necessary sources of	Computer science; Statistics for Economists;	Business on the Internet; Basics of international trade;

Code	Competence	Previous disciplines/modules, practices*	Subsequent disciplines/modules, practices*
	information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data received from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions based on incoming information and data	Economic informatics; International statistical databases; Interdisciplinary coursework; Interdisciplinary course project; Business process modeling	Electronic commerce in international business; Big Data Project-technological internship; Undergraduate practice; Final state examination procedures; Degree thesis procedures

4. COURSE WORKLOAD AND LEARNING ACTIVITIES

The total labor intensity of the discipline "Geoinformation systems: visualization of spatial data" is 3 credits.

Table 4.1. Types of educational work by periods of mastering the OP in for FULL-time education

Type of educational work	TOTAL, academic hours.	Semester 3
Contact,, ac.h	*34*	*34*
Lectures		
Lab work (LR)		
Seminars (workshops/tutorials)	34	34
Self-study (ies), academic hours	*56*	*56*
Evaluation and assessment academic hours	*18*	*18*
Overall labor intensity of the discipline — *academic hours*	**108**	**108**
Overall labor intensity of the discipline — credits	**3**	**3**

5. COURSE MODULES AND CONTENTS

Table 5.1. The content of the discipline (module) by type of academic work

Name of the discipline section	Contents	Type of educational work
Section 1. Fundamentals of geoinformatics	Topic 1.1. Introduction to the key concepts of geoinformation systems	Lectures, Seminars
	Topic 1.2. Spatial data and cartographic layers	Lectures, Seminars

Name of the discipline section	Contents	Type of educational work
	Topic 1.3. Geoinformatics, cartography and remote sensing of the Earth	Lectures, Seminars
Section 2. Methods of visualization of spatial data	Topic 2.1. Ways of depicting phenomena on the map	Lectures, Seminars
	Topic 2.2. Design of a cartographic work	Lectures, Seminars
	Topic 2.3. Creating and editing spatial data	Lectures, Seminars
Section 3. Use of geoinformation systems	Topic 3.1. Search and visualization of socio-economic data	Lectures, Seminars
	Topic 3.2. Application of Earth remote sensing data	Lectures, Seminars
	Topic 3.3. Research on maps	Lectures, Seminars

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Material and technical support of the discipline

Audience type	Equipping the classroom	Specialized educational/laboratory equipment, software and materials for mastering the discipline (if necessary)
Lecture hall	Auditorium 101 for conducting lecture-type classes, equipped with a set of specialized furniture; a blackboard (screen) and technical means of multimedia presentations.	Asus F6A Laptop, Casio XJ-S 400 UN Multimedia Projector, Casio XJ-V 100W Multimedia Projector, GEHA 244*244 Projection Screen, Draper 203*1 Wired Screen, Defender Mercury 35 Mkll Speaker System, Philip TV
Seminary	Auditorium 103 for seminar-type classes, group and individual consultations, ongoing monitoring and interim certification, equipped with a set of specialized furniture and multimedia presentation equipment.	Asus F6A Laptop, Casio XJ-S400UN Multimedia Projector, Digis Electra MW DSEM - 1105 Motorized Screen
	Computer class 19 for conducting classes, group and individual consultations, current control and intermediate certification, equipped with personal computers (in the amount of 21 pcs.), a blackboard (screen) and multimedia presentation equipment.	Lenovo Intel I5 10160T/8 GB/256 GB/audio Monoblock, 24" monitor, Casio XJ-V 100W Multimedia Projector, Digis Electra 200*150 Dsem-4303 motorized Screen
Computer class	Auditorium 29 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.	Lenovo AIO-510-22ISH Intel I5 2200 MHz/8 GB/1000 GB/DVD/audio Monoblock, 21" monitor, Casio XJ-V 100W

Audience type	Equipping the classroom	Specialized educational/laboratory equipment, software and materials for mastering the discipline (if necessary)
		Multimedia Projector, Motorized Digis Electra 200*150 Dsem-4303 screen

* - the audience for independent work of students is MANDATORY!

7. RECOMMENDED SOURCES FOR COURSE STUDIES

Basic literature:

1. Baldina E. A., Labutina I. A. Decoding of aerospace images: textbook, [electronic edition of network distribution] / – 2nd ed., revised and supplemented. — KDU, Dobrosvet Moscow, 2021. — 269 p.
2. Bykovsky, N. M. Cartography. Historical essay / N. M. Bykovsky. — Moscow : Yurayt Publishing House, 2022. — 200 p. — (Anthology of thought). — ISBN 978-5-534-11708-0. - Text : electronic // Yurayt Educational Platform [website]. — URL: https://urait.ru/bcode/496060 (accessed: 08.05.2022).
3. Lurie I. K., Samsonov T. E. Fundamentals of geoinformatics. — Faculty of Geography, Moscow State University, 2016. — 200 p.
4. Kargashin P. E. Fundamentals of digital cartography: A textbook for bachelors. 2nd ed., add. — Moscow: Moscow, 2020. — 106 p.
5. Samsonov T. E. Fundamentals of geoinformatics: a workshop. — Faculty of Geography, Moscow State University, 2018. — 460 p.
6. Antamatten P. How to make maps: an introduction to the theory and practice of cartography. Abingdon, Oxon; New York, NY: Rutledge, 2021.

Additional literature:

1. Lurie I. K. Geoinformation mapping. Methods of geoinformatics and digital processing of satellite images. Moscow: KDU, 2008. 424 p.
2. The Routledge handbook of mapping and cartography / edited by A. Kent, P. Vujakovic, Routledge (Firm). Milton Park, Abingdon, Oxon ; New York, NY: Routledge, 2018.
3. Kapralov E. G. et al. Geoinformatics / ed. V. S. Tikunov. M.: Academy, 2005. 480 p.

Resources of the Internet information and telecommunication network:

1. EBS RUDN and third-party EBS, to which university students have access on the basis of concluded contracts:
    - Electronic library system of RUDN – EBS RUDN http://lib.rudn.ru/MegaPro/Web
    - EBS "University Library online" http://www.biblioclub.ru
    - ABS Yurayt http://www.biblio-online.ru
    - EBS "Student Consultant" www.studentlibrary.ru
    - EBS "Doe" http://e.lanbook.com/

- EBS "Trinity Bridge"

2. Databases and search engine:
- electronic fund of legal and regulatory and technical documentation http://docs.cntd.ru /
- Yandex search engine https://www.yandex.ru/
- Google search engine https://www.google.ru /
- SCOPUS abstract database http://www.elsevierscience.ru/products/scopus/
- Natural Earth portal https://www.naturalearthdata.com/
- World Bank database https://data.worldbank.org/

Educational and methodological materials for independent work of students during the development of the discipline/ module*:
All educational and methodological materials for independent work of students are placed in accordance with the current procedure on the page of the discipline in TUIS https://esystem.rudn.ru/course/view.php?id=2318

8. EVALUATION TOOLKIT & GRADING SYSTEM FOR ASSESSING THE LEVEL OF FORMATION OF COMPETENCIES IN THE COURSE

Assessment materials and a point-rating system* for assessing the level of competence formation (part of competencies) based on the results of mastering the discipline "Geoinformation systems: visualization of spatial data" are presented in the Appendix to this Work Program of the discipline, developed in full and available to students on the discipline page in TUIS RUDN.

The program is compiled in accordance with the requirements of the OS in the RUDN.

* - OM and BRS are formed on the basis of the requirements of the relevant local regulatory act of the RUDN.

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