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**Federal State Autonomous Educational Institution for Higher Education  
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA  
NAMED AFTER PATRICE LUMUMBA  
(RUDN University)**

**Academy of Engineering**

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

**COURSE SYLLABUS**

**Geoinformation Systems for Geology Based on Space Imagery**

course title

**Recommended by the Didactic Council for the Education Field of:**

**05.04.01 Geology**

field of studies / speciality code and title

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

**Mining Geology**

higher education programme profile/specialisation title

**2025**

## 1. COURSE GOAL(s)

The goal of the course “Geoinformation Systems for Geology Based on Space Imagery” is to acquire knowledge, skills and abilities in the field of geoinformation systems and their application to solve geological issues.

The main objectives of the course are:

- mastering modern geoinformation systems;
- familiarization with remote sensing data;
- developing the ability to utilize geoinformation systems and satellite imagery to address geological issues.

## 2. REQUIREMENTS TO LEARNING OUTCOMES

The course implementation is aimed at the development of the following competences (competences in part):

*Table 2.1. List of competences that students acquire during the course*

Competence code	Competence descriptor	Competence formation indicators (within this course)
GC-1.	Able to critically analyze problem situations on the basis of a systematic approach, develop a strategy of action.	GC-1.1. Analyzes the problem, identifying its basic components; GC-1.2. Performs information retrieval for solving the task by various types of inquiries; GC-1.3. Suggests options for solving the problem, analyzes the possible consequences of their use.

## 3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course refers to the elective component of (B1) block of the higher educational programme curriculum.

Within the higher education programme students also master other (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the course study.

*Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results*

Competence code	Competence descriptor	Previous courses/modules	Subsequent courses/modules
GC-1.	Able to critically analyze problem situations on the basis of a systematic approach, develop a strategy of action.	Digital Technologies in Geology	Groundwater Dynamics; Graduate Qualification Work

## 4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course “Geoinformation Systems for Geology Based on Space Imagery” is 3 credit units.

*Table 4.1. Types of academic activities during the periods of higher education programme mastering*

Type of academic activities		TOTAL, ac. hrs.	Semesters/ training modules
			<b>2</b>
<i>Contact academic hours</i>		<i>34</i>	<i>34</i>
Lectures (LC)		-	-
Lab work (LW)		-	-
Seminars (workshops/tutorials) (S)		34	34
<i>Self-studies</i>		<i>74</i>	<i>74</i>
<i>Evaluation and assessment (exam/passing/failing grade)</i>			<i>Failing grade</i>
<b>Course workload</b>	academic hours	<b>108</b>	<b>108</b>
	credits	<b>3</b>	<b>3</b>

## 5. COURSE CONTENTS

*Table 5.1. Course contents and academic activities types*

Course module title	Course module contents (topics)	Academic activities types
Module 1. Geoinformation systems and remote sensing	1.1. General ideas about geoinformation systems. Key skills to work in them;	S
	1.2. Fundamentals of remote sensing. Data processing.	S
Module 2. The applications of geoinformation systems	2.1. Analysis of uranium mines in Africa based on satellite imagery in geographic information systems	S

\* - to be filled in only for **full**-time training; LC - lectures; LW - lab work; S - seminars.

## 6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

*Table 6.1. Classroom equipment and technology support requirements*

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
Seminar	A classroom for conducting seminars, group and individual consultations, current and mid-term assessment; equipped with a set of specialised furniture and technical means for multimedia presentations.	
Computer Lab	A classroom for conducting classes, group and individual consultations, current and mid-term assessment, equipped with personal computers, a board (screen) and technical means of multimedia presentations.	Specialized software: <ul style="list-style-type: none"> <li>• QGIS</li> <li>• ENVI</li> <li>• ArcGIS</li> </ul>
Self-studies	A classroom for independent work of students (can be used for seminars and consultations), equipped with a set of specialised furniture and	

	computers with access to the electronic information and educational environment.	
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## 7. RESOURCES RECOMMENDED FOR COURSE STUDY

### *Main reading:*

1. Korotayev M.V. Pravikova N.V. Application of geoinformation systems in geology M, KDU, 2008
2. Korotayev M.V. Pravikova N.V. Apletalin A.V. Information technologies in geology M, KDU, 2012
3. G. F. Bonham-Carter, Daniel F Merriam Geographic Information Systems for Geoscientists: Modelling with GIS

### *Additional reading:*

1. Kats Ya.G., Tevelev A.V., Poletaev A.I. Fundamentals of space geology: textbook. Moscow: Nedra, 1988.
3. Ravi P. Gupta Remote Sensing Geology.

### *Internet sources:*

1. Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements:
  - RUDN Electronic Library System (RUDN ELS) <http://lib.rudn.ru/MegaPro/Web>
  - EL "University Library Online" <http://www.biblioclub.ru>
  - EL "Yurayt" <http://www.biblio-online.ru>
  - EL "Student Consultant" [www.studentlibrary.ru](http://www.studentlibrary.ru)
  - EL "Lan" <http://e.lanbook.com/>
  - EL "Trinity Bridge" <http://www.trmost.ru>
2. Databases and search engines:
  - electronic foundation of legal and normative-technical documentation <http://docs.cntd.ru/>
  - Yandex search engine [https:// www .yandex.ru/](https://www.yandex.ru/)
  - Google search engine <https://www.google.ru/>
  - Scopus abstract database <http://www.elsevierscience.ru/products/scopus/>

### *Training toolkit for self- studies to master the course \*:*

1. Guidelines for students on the development of the course “Geoinformation Systems for Geology Based on Space Imagery”.

\* The training toolkit for self- studies to master the course is placed on the course page in the university telecommunication training and information system under the set procedure.

## 8. ASSESSMENT TOOLKIT AND GRADING SYSTEM\* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL UPON COURSE COMPLETION

The assessment toolkit and the grading system\* to evaluate the competences formation level (competences in part) upon the course study completion are specified in the Appendix to the course syllabus.

\* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

## **DEVELOPERS:**

**Senior Lecturer, Department  
of Mechanics and Control  
Processes**

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position, educational department

**Deputy Director, Remote Sensing**

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position, educational department

**E. Shemyakina**

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name and surname

**A. Inyushin**

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name and surname

## **HEAD OF EDUCATIONAL DEPARTMENT:**

**Department of Mechanics and  
Control Processes**

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educational department

**Yu. Razoumny**

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name and surname

## **HEAD OF HIGHER EDUCATION PROGRAMME:**

**Head of the Department of  
Subsoil Use and Oil&Gas  
Engineering**

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position, educational department

**A. Kotelnikov**

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name and surname