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

2024

1. COURSE GOAL(s)

The goal of the course "Geoinformation Systems for Geology Based on Space Imagery" is the acquisition of knowledge, skills and abilities in the field of geoinformation systems and how to use them to solve geological issues.
The main objectives of the course are:
- mastering of modern geoinformation systems;
- familiarization with remote sensing data;
- the ability to apply geoinformation systems and satellite imagery to solve 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 search, critical analysis of problem situations based on a systematic approach, develop an action strategy.	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 search, critical analysis of problem situations based on a systematic approach, develop an action strategy.	Digital Technologies in Geology	Groundwater Dinamics; Final state attestation

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
		2
Contact academic hours	*34*	*34*
Lectures (LC)	-	-
Lab work (LW)	-	-
Seminars (workshops/tutorials) (S)	34	34
Self-studies	*74*	*74*
Evaluation and assessment (exam/passing/failing grade)		*Failing grade*
Course workload — academic hours	**108**	**108**
Course workload — credits	**3**	**3**

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 (in the amount of 24 pcs), a board (screen) and technical means of multimedia presentations.	Specialized software: • QGIS • ENVI • ArcGIS
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.	

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
- 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/
- 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	E. Shemyakina
position, educational department	name and surname

Deputy Director, Remote Sensing	A. Inyushin
position, educational department	name and surname

HEAD OF EDUCATIONAL DEPARTMENT:

Department of Mechanics and Control Processes	Yu. Razoumny
educational department	name and surname

HEAD OF HIGHER EDUCATION PROGRAMME:

Head of the Department of Subsoil Use and Oil&Gas Engineering	A. Kotelnikov
position, educational department	name and surname