

*Federal State Autonomous Educational Institution of Higher Education  
“Russian University of Peoples' Friendship”*

*Agrarian Technological Institute*

Recommended ISSC

**PRACTICE PROGRAM**

**Practice subject:**

Practice in GIS

**Recommended for the direction of training / specialty:**

35.04.09 Landscape architecture

**Program orientation (profile):**

Management and design of urban green infrastructure

**Graduate Qualifications:** Master

*(in accordance with the order of the Ministry of Education and Science of the Russian Federation of  
12.09.2013 №1061)*

**1. The goal** of the practice for the students following the curriculum “Management and design of urban green infrastructure” is the consolidation of theoretical and practical knowledge gained by students in the study of the discipline "GIS". Study the basic terms, concepts, and definitions in the field of work with GIS software, gain practical skills in the field of spatial assessment of urban and natural ecosystems and their components.

**2. The research tasks are:**

- mastering the basics of digital cartography;
- obtaining basic skills in the field of database structures and principles of working with them;
- obtaining skills to collect and organize data in geographic information systems;
- obtaining skills in data processing and analysis in geographic information systems;
- obtaining skills in data interpolation and the basics of spatial modeling;
- Mastering the visualization of geographic information systems.

**3. Place of industrial practice in the structure of EP.** Educational practice is included in the basic part of the educational and industrial practices of the cycle B.2. The educational practice of the “GIS” is based on the knowledge, skill, and competencies acquired in the process of studying the disciplines.

**4. Forms of production practice** – auditor.

**5. Place and time of practical training.** Educational practice takes place within 3 weeks. Educational practice is held on the basis of the laboratory "Smart technologies for sustainable development in the conditions of an urbanized environment" and the Center for Mathematical Modeling and Design of Sustainable Ecosystems of ATI RUDN.

**6. Competence of the student, formed as a result of practical training.**

As a result of the training practice, the student should acquire the following practical skills, abilities, universal and professional competencies:

*General professional:*

- capability to use the principle laws of natural science disciplines in professional activity, implement approaches of mathematical analysis and modeling, experimental research (PC-1);
- possession of the main methods, methods, and means of obtaining, storing, processing information, has computer skills as a means of managing information (PC-2)

- knowledge of the patterns in the dynamics of urban ecosystems in different climatic and geographical conditions at different intensities of technogenic load (PC – 8);
- possession of the main methods of landscape inventory, condition monitoring, and inventory on landscape architecture objects (PC – 9);

*Scientific-research activity:*

- capability to implement up-to-date methods to investigate landscape architecture objects (PC-37);
- readiness to study scientific-technical information, home and foreign experience on the research topic in the sphere of landscape architecture (PC – 38);
- readiness to carry out the experiment following adjacent methodology, analyze the results (PC -39)
- capability to use methods of computer projecting and GIS (PC-40);

*Projecting activity:*

- capability to participate in the development of engineering and technological issues in the design of objects of landscape architecture using new information technologies and automated design systems (PC-22).

As a result of mastering the practice, the student must:

***Know:***

- The concept of maps as the main sources of information, coordinate systems
- basics of cartographic projections, landforms
- the procedure for determining the coordinates of points on the map, measuring the distance between points

***Be able to:***

- determine the topographic maps nomenclature
- determine the coordinates of points on the map
- study the relief on the map, determine the slope of the terrain, elevations, and elevations between points on the map
- use the legend on the map
- use map scale

***Own:***

- skills of working with a map when determining the coordinates of points of skills of working with a map when studying terrain,
- determine the heights of points,
- elevations, slopes.

## 7. The structure and content of manufacturing Practice in GIS

The total volume of work experience is 6 credits (216 hours.)

№	Sections (stages) of practice	Kinds of educational work in practice, including independent work of students and labor input (hours)		Forms of current control
1	Preparatory stage, familiarization of students with general information about the objects and methods of research, work plan, safety instructions, organizational issues	Cameral work (8 hours)		Report
2	Selecting the object of study using the software Google Earth.	Analytical studies (16 hours)	Cameral work (14 hours)	The report, practice diary
3	Digitization of the object of study using QGIS software	Analytical studies (32hours)	Cameral work (14 hours)	The report, practice diary
4	Selection of raster images for assessment of climatic characteristics and assessment of relief Assessing these characteristics using QGIS software	Analytical studies (40 hours)	Cameral work (14 hours)	The report, practice diary
	Selection of spatial environmental data for the object of study and their evaluation using QGIS tools: working with the vector, basic statistics, field calculator, interpolation	Analytical studies (48 hours)	Cameral work (14 hours)	The report, practice diary
5	Preparation and protection of the report on educational practice.	Cameral work, report preparation (10 hours)	Report protection (6 hours)	The report, practice diary

**8. Educational, research and development technologies used in manufacturing practice:** Computer classes, specialized audience, and library fund, laser range finder, Google Earth, Quantum GIS (QGIS), Photoshop are used for material and technical support of the educational practice.

**9. Teaching and methodological support of independent work of students in Practice in GIS.**

The program of educational practice developed by the Department of Landscape Design and Sustainable Ecosystems of the Agrarian-Technological Institute of RUDN University, Methodical recommendations on the organization and conduct of industrial practice for graduate students of the direction "Landscape Architecture".

## **10. Material and technical support of the Practice in GIS:**

1. Training classes equipped with multimedia projectors.
2. Computer classes ATI, information library center RUDN University with access to the electronic library system RUDN University, the Internet.

## **11. Teaching and methodological and information support of students' independent work in educational practice**

### **a) Main literature:**

1. Working with the ARGINFO Open Development Environment.
2. Vasenev I.I., Meshalkina Yu.L., Grachev D.A. Geoinformation systems in soil science and ecology Interactive course / Ed. I.I. Vaseneva - Moscow: RGAU-MSHA, 2010. 212
3. Geoinformatics. Prince one; by ed. Vs Tikunova. - M .: Publishing Center "Academy", 2008. -384 p.
4. De Mears M. Geographic information systems. Basics .: Trans. from English - M: Date +, 1999, 384 p.
5. Zhurkin IG, Shaitura S.V. Geoinformation systems. - M .: Kudits-Press, 2008. - 272s.

### **b) additional literature:**

1. ActiveX Controls and Automation Servers for Windows NT Developers
2. ARGINFO Data Management. Concepts, data models, database design, and storage.
3. Koldoba A.V., Poveschenko Yu.A., Samarskaya E.A., Tishkin V.F. Methods of mathematical modeling of the environment. - M .: Nauka, 2000.
4. Lurie I.K. Geoinformation mapping: methods of geoinformatics and digital processing of satellite images. - M .: KDU, 2008. - 423 p.
5. Lychak A.I., Beaver T.V. New computer technologies in ecology. - Textbook. - Simferopol: Tavriya Plus, 2004. - 156 p.
6. Trifonova T.A., Mishchenko N.V., Krasnoshchekov A.N. Geoinformation systems and remote sensing in environmental studies. - M .: Akademicheskyy Project, 2005. - 352 p.

### **c) Internet portals**

3. <http://landscape.edu.ru>
4. <http://www.dataplus.ru>
5. <https://www.worldclim.org/>

6. <https://www.qgis.org/>

## 12. Forms of intermediate certification (on the basis of practice)

Report on the practice and its protection

## 13. The Fund of Appraisal Means for Certifying Students for the Study Practice in GIS

Differentiated practice credit is equal to the assessment of theoretical training and is taken into account when summing up the overall performance of students. The final stage of the practice is to summarize its results. Students doing practical work, pass to the department a practice diary reflecting the work and report on the passage of educational practice. When defending the practice based on the contents of the report and reply to the questions ahead practice for wasps. Practice materials (report and diary) after its protection are stored in the department. The assessment is carried out according to a points - rating system, the distribution of points and recalculation in the estimates are presented (Table 1, 2).

**Table 1. Criteria for assessing student performance.**

Response evaluation criteria	Points		
	The answer does not meet the criteria	The answer partially meets the criteria	The answer fully meets the criteria
Timely submission of the report	0	2	5
Work in program QGIS and Google Earth	0	5	10
Execution of an individual task (report content)	0	23	45
Individual report protection (answers to questions from the teacher)	0	20	40

Table 2. Correspondence of assessment systems (previously used estimates of final academic performance, ECTS scores and point-rating system (BRS) of current performance assessments).

<b>BRS points</b>	<b>Traditional RF ratings</b>	<b>Ratings ECTS</b>
95 - 100	5	A
86 - 94		B
69 - 85	4	C
61 - 68	3	D
51 - 60		E
31 - 50	2	F <sub>x</sub>
0 - 30		F
51-100	Test	Passed

Explanation of the rating table:

### **Description of ECTS ratings**

<b>A</b>	<b>“Excellent”</b> - the theoretical content of the course has been fully mastered , without gaps, the necessary practical skills of working with the mastered material have been formed, all the training tasks provided for by the training program have been fulfilled , the quality of their implementation is estimated by the number of points close to the maximum .
<b>B</b>	<b>“Very good”</b> - the theoretical content of the course has been fully mastered , without gaps, the necessary practical skills of working with the mastered material are mostly formed, all the training tasks provided for by the training program are completed, the quality of performance of most of them is assessed by the number of points close to the maximum .
<b>C</b>	<b>“Good”</b> - the theoretical content of the course is mastered completely , without gaps, some practical skills of working with mastered material are not sufficiently developed , all the training tasks provided by the training program are completed , the quality of performance of none of them is assessed by the minimum number of points, some types of tasks are completed with errors .
<b>D</b>	<b>“Satisfactory”</b> - the theoretical content of the course is partially mastered, but the gaps are not significant, the necessary practical skills of working with the material mastered are mostly formed, most of the training tasks provided by the training program are completed, some of the tasks performed may contain mistakes.
<b>E</b>	<b>“Mediocre”</b> - the theoretical content of the course is partially mastered, some practical skills are not formed, many of the training tasks provided by the training program are not met, or the quality of performance of some of them is estimated by the number of points close to the minimum.

<b>Fx</b>	“ <b>Conditionally unsatisfactory</b> ” - the theoretical content of the course is partially mastered , the necessary practical skills are not formed , most of the training tasks provided by the training program are not met , or the quality of their implementation is assessed by the number of points close to the minimum ; With additional independent work on the course material, it is possible to improve the quality of the performance of educational tasks.
<b>F</b>	“ <b>Certainly unsatisfactory</b> ” - the theoretical content of the course is not mastered, the necessary practical skills of work are not formed, all the completed training tasks contain blunders, additional independent work on the course material will not lead to any significant improvement in the quality of the training tasks.

**Positive evaluations**, the preparation of which the rate is counted as the learner traversed are estimates A, B, C, D, and E.

**FX** rated the student on the educational practice of an educational program, after consultation with the appropriate teacher, is obliged to successfully fulfill the required minimum amount of educational work provided for by the program of study, in accordance with the terms established by the educational part, and present the results of this work to this teacher. If the quality of work is found to be satisfactory, then the final assessment of FX is increased to E and the student is allowed to further training.

In the event that the quality of the educational work remains unsatisfactory, the final grade drops to F and the student is submitted for expulsion. In the case of an assessment of F or FX, the student is presented for expulsion regardless of whether he has any other debts in other disciplines.

The program is compiled in accordance with the requirements of OS VO RUDNF / FROS VO.

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