Federal State Autonomous Educational Institution of Higher Education

PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA

NAMED AFTER PATRICE LUMUMBA (RUDN University)

Agrarian and Technological Institute

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

COURSE SYLLABUS

Scientific writing skills

course title

Recommended by the Didactic Council for the Education Field of:

35.03.09 Landscape architecture
Management and design of urban green infrastructure

field of studies / speciality code and title

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

Landscape architecture

higher education programme profile/specialisation title

1. COURSE GOAL(s)

The goal of the «Scientific writing skills» is to provide basic theoretical knowledge and practical skills in scientific writing, data collecting, processing and presenting research results in the sphere of landscape architecture.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The course is designed for students to acquire following competences:

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

Competence code	Competence descriptor	Competence formation indicators (within this course)
GC-1	Student is able to search, critically analyze problem situations based on a systematic approach, and develop a strategy for action.	GC-1.1 Student is able to apply systematization to solve tasks;
		GC-1.2 Student is able to search and analyze information.
GC-3	Student is able to organize and manage the work of the team, developing a team strategy to achieve the goal.	GC-3.1 Student is able to organize team work on the project;
		GC-3.2 Student is able to interact with the executive authorities to coordinate all stages of design.
GC-5	Student is able to analyze and take into account the diversity of cultures in the process of intercultural interaction.	GC-5.1 Student is able to overcome cultural barriers by perceiving intercultural differences;
		GC-5.2 Student is able to overcome the cultural barrier by perceiving cross-cultural differences.
GC-6	Student is able to determine and implement the priorities of his own activities and ways to improve it based on self-assessment.	GC-6.1 Student is able to plan his life activities for the period of study in an educational organization;
		GC-6.2 Student is able to determine the tasks of self-development and professional growth, distribute them for long-medium- and short-term with justification of their relevance and determination of the necessary resources.
GPC-1	Ability to analyze modern problems of science and production, solve complex (non-standard) tasks in professional activity.	GPC-1.1 Ability to solve complex (non-standard) tasks in professional activities;
		GPC-1.2 Ability to analyze modern problems of science and production.
GPC-2	Student is able to transfer professional knowledge using modern pedagogical techniques.	GPC-2.1 Student is able to transfer professional knowledge;
		GPC-2.2 Student is able to transfer professional knowledge using information technology.
GPC-3	Student is able to develop and implement new effective technologies in professional activities.	GPC-3.1 Student is able to implement new effective technologies in professional activity;
		GPC-3.2 Student is able to develop new efficient technologies in professional activity; Is able to develop new efficient technologies in professional activity.

Competence code	Competence descriptor	Competence formation indicators (within this course)
GPC-4	Student is able to carry out scientific research, analyse the results and prepare reports.	GPC-4.1 Student is able to carry out scientific research;
		GPC-4.2 Student is able to prepare report documentation.
GPC-5	Student is able to carry out a techno-economic feasibility study of projects in professional practice.	GPC-5.1 Student is able to carry out economic feasibility study of projects;
		GPC-5.2 Student is able to carry out technical feasibility studies of projects.
GPC-6	Student is able to manage teams and organise production processes.	GPC-6.1 Student is able to organize production processes;
		GPC-6.2 Student is able to manage teams.
PC-18	Ability to prepare scientific and technical reports, reviews, publications based on the results of research in the field of landscape architecture.	PC-18.1 Ability to prepare scientific articles, reports on ongoing research;
		PC-18.2 Ability to develop work plans and programs for scientific research in the field of landscape architecture.

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course «Scientific writing skills» refers to the variable component of (B1) block B1 of the higher educational programme curriculum.

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

Competence code	Competence descriptor	Previous courses/modules, courses*	Subsequent courses/modules, courses*
GC-1	Student is able to search, critically analyze problem situations based on a systematic approach, and develop a strategy for action.		Landscape planning and sustainable development; Phytopathology and Plant Protection; Landscape engineering and nature-based solution; Principles of remote sensing and modelling; Advances in environmental monitoring.
GC-3	Student is able to organize and manage the work of the team, developing a team strategy to achieve the goal.		Landscape planning and sustainable development; Phytopathology and Plant Protection; Landscape engineering and nature-based solution; Principles of remote sensing and modelling; Advances in environmental monitoring.
GC-5	Student is able to analyze and take into account the diversity of cultures in the process		Landscape planning and sustainable development; Phytopathology and Plant Protection; Landscape

Competence code	Competence descriptor	Previous courses/modules, courses*	Subsequent courses/modules, courses*
	of intercultural interaction.		engineering and nature-based solution; Principles of remote sensing and modelling; Advances in environmental monitoring.
GC-6	Student is able to determine and implement the priorities of his own activities and ways to improve it based on self-assessment.		Landscape planning and sustainable development; Phytopathology and Plant Protection; Landscape engineering and nature-based solution; Principles of remote sensing and modelling; Advances in environmental monitoring.
GPC-1	Ability to analyze modern problems of science and production, solve complex (non-standard) tasks in professional activity.		Landscape planning and sustainable development; Phytopathology and Plant Protection; Principles of remote sensing and modelling.
GPC-2	Student is able to transfer professional knowledge using modern pedagogical techniques.		Landscape planning and sustainable development; Phytopathology and Plant Protection; Principles of remote sensing and modelling.
GPC-3	Student is able to develop and implement new effective technologies in professional activities.		Landscape planning and sustainable development; Phytopathology and Plant Protection; Landscape engineering and nature-based solution.
GPC-4	Student is able to carry out scientific research, analyse the results and prepare reports.		Landscape planning and sustainable development; Phytopathology and Plant Protection; Landscape engineering and nature-based solution.
GPC-5	Student is able to carry out a techno-economic feasibility study of projects in professional practice.		Landscape planning and sustainable development; Phytopathology and Plant Protection; Landscape engineering and nature-based solution.
GPC-6	Student is able to manage teams and organise production processes.		Landscape planning and sustainable development.

Competence code	Competence descriptor	Previous courses/modules, courses*	Subsequent courses/modules, courses*
PC-18	Ability to prepare scientific and technical reports, reviews, publications based on the results of research in the field of landscape architecture.		

* To be filled in according with the competence matrix of the higher education programme.

4. COURSE WORKLOAD

The total workload of the course is 6 credits (216 academic hours).

5. COURSE CONTENTS

*Table 5.1. Course contents**

Modules	Contents (topics, types of practical activities)	Workload, academic hours
Module 1. Development of the scientific picture of the world.	1.1 Stages of science development; 1.2 Evolutionary and revolutionary models of science development.	10
Module 2. Methodology of scientific research.	2.1 Scientific observation; 2.2 Experiment; 2.3 Models and modeling.	15
Module 3. Introduction into descriptive statistics.	3.1 Measuring scales: ordinal, integral and ratio scales, continuous and discrete variables; 3.2 Sample. Representativeness of sample; 3.3 Mean, range, variance, coefficient of variance, stand deviation.	15
Module 4. Data analysis and prediction.	4.1 Confident interval. P-level; 4.2 T statistics and t-test; 4.3 Correlation (Pearson and Spearmen correlation coefficients); 4.4 Regression (multiple, linear/ non-linear regression).	22
Module 5. Scientific writing: thesis, publication, monograph.	5.1 Conference thesis; 5.2 Scientific paper; 5.3 Master and PhD thesis.	15
Module 6. Visualization of research results – from tables towards GIS.	6.1 Approaches to visualize scientific results; 6.2 Tables: structural elements and design rules; 6.3 Graphical visualization of research results.	15
Module 7. Business in science.	7.1 International scientific community; 7.2 Commercialization of scientific results. Sources of research funding; 7.3 National and international grants and programs. Scientific foundations.	15
Independent work of students.		74
Control (exam/test with assessment).		35

Modules	Contents (topics, types of practical activities)	Workload, academic hours
	TOTAL:	**216**

* The contents of course through modules and types of practical activities shall be FULLY reflected in the student's course report.

6. COURSE EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

The infrastructure and technical support necessary for the course implementation include: certified soil-ecological laboratory, individual consultations, routine monitoring and interim certification, equipped with a set of specialized furniture and equipment. (rooms 203, 418). Specialized educational/laboratory equipment includes Draper Diplomat 213x213 83" tripod screen, a workstation based on a complete system unit and a monitor for working with graphical applications. Model AG_PC Axiom Group/Intel Core I3 Processor 8 Cooperative memory Crucial by Micron DDR4 8SV*2;Motherboard PRIME B360-PLUS; MoHHTop Samsung 23.5, Software ArchiCAD 15, AutoCAD12, SketchUp, QGIS 2.10 (Quantum GIS).

7. RESOURCES RECOMMENDED FOR COURSE

Main readings:

— Printed publications:

1. Borovikov, V. Art of computer data analysis. Piter. Saint-Petersburg. 2003.
2. Diez, D.M., Barr C.D. and Centinkaya-Rundel M. OpenIntro Statistics Second edition. Second Edition. Current Printing: July 2014.
3. Aller, L., Bennett T., Lehr J. H., Petty R. J., and Hackett G. DRASTIC: A standardized system for evaluating ground water pollution potential using hydrogeological settings. EPA/600/2-87/035. Washington, D.C.: Environmental Agency. 1987.
4. Bailey, T. C., and Gatrell A. C. Interactive spatial data analysis. Harlow, UK: Longman. 1995.
5. C-P. Pifo. Statistica. Hockenheim. 2011.

— Electronic and printed full-text materials:

1. Batty, M. J. 1997. The computable city. International Planning Studies 2: 155–73.
2. Batty, M. J., and P. A. Longley. 1994. Fractal cities: A geometry of form anfunction. San Diego, Calif.: Academic Press.
3. Benenson, I. 2004. Agent-based modeling: From individual residential to urban residential dynamics. In Spatially integrated social science, ed. M. Goodchild and D. J. Janelle, 67–94. New York: Oxford University Press.
4. Berger T. Agent-based spatial models applied to agriculture: a simulation tool for technology diffusion, resource use changes and policy analysis. 2001. Agricultural Economics. # 25. P. 245–260.
5. Peuquet, D. 2002. Representations of space and time. New York: Guilford.
6. Tomlin, C. D. 1990. Geographic information systems and cartographic modeling. Englewood Cliffs, N.J.: Prentice Hall.

7. Worboys, M. F., and M. Duckham. 2004. GIS: A computing perspective. New York: Taylor and Francis.
8. Zeiler, M. 1999. Modeling our world: The ESRI guide to geodatabase design. Redlands, Calif.: ESRI Press.

Additional readings:

— Electronic and printed full-text materials:

1. Carey, G. F., ed. 1995. Finite element modeling of environmental problems: Surface and subsurface flow and transport. New York: John Wiley and Sons.
2. Crosier, S. J., M. F. Goodchild, L. L. Hill, and T. R. Smith. 2003. Developing an infrastructure for sharing environmental models. Environment and Planning B: Planning and Design 30: 487–501.
3. Dibble, C., and P. G. Feldman. 2004. The GeoGraph 3D Computational Laboratory: network and terrain landscapes for RePast. Journal of Artificial Societies and Social Simulation 7(1). Available: jasss.soc.surrey.ac.uk/ 7/1/7.html.
4. Engelen G., White R., De Nij T. Environment Explorer: Spatial Support System for the Integrated Assessment of Socio-Economic and Environmental Policies in the Netherlands. 2003. Integrated Assessment. V. 4, #. 2. P. 97–105..
5. Goodchild M.F. GIS and modeling overview. In: GIS, Spatial Analysis and Modeling. Maguire D.J. , Batty M., Goodchild M.F. (Eds). ESRI Press, Redlands. P. 2-17.
6. Goodchild, M. F., and J. Proctor. 1997. Scale in a digital geographic world. Geographical and Environmental Modeling 1: 5–23.
7. Goodchild, M. F., B. O. Parks, and L. J. Steyaert. 1993. Environmental modeling with GIS. New York: Oxford University Press.

Internet sources:

1. Open statistic software www.r-project.org
2. Statistica manuals www.statsoft.ru
3. Open GIS software www.qgis.com
4. Science Direct: http://www.sciencedirect.com
5. EBSCO: http://search.ebscohost.com
6. Springer/Kluwer: http://www.springerlink.com
7. Tailor & Francis: http://www.informaworld.com
8. *Data bases and survey systems*
9. GISLAB: http://www.gis-lab.info
10. Google Earth Engine https://explorer.earthengine.google.com/#workspace
11. USGS Earth Explorer https://earthexplorer.usgs.gov/
12. Copernicus Global Land Service https://land.copernicus.eu/global/products/lc
13. Global Soil Map and Database https://soilgrids.org/

Educational and methodological materials for independent work of students during the development of the course/module:*

1. Workbook on the discipline «Scientific writing skills».

2. Methodological guidelines for students on the development of the discipline «Scientific writing skills».

*The training toolkit and guidelines for the course are 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 AS COURSE RESULTS

The assessment toolkit and the grading system* to evaluate the level of competences (competences in part) formation as the course results are specified in the Appendix to the course syllabus.

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

DEVELOPERS:

Associate Professor, department of landscape planning and sustainable ecosystems		**V. I. Vasenev**
position, educational department	signature	name and surname.

HEAD OF EDUCATIONAL DEPARTMENT:

Director, department of landscape planning and sustainable ecosystems		**E. A. Dovletyarova**
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HEAD OF HIGHER EDUCATION PROGRAMME:

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