Federal State Autonomous Educational Institution of Higher Education

PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE LUMUMBA

Agrarian and Technological Institute

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

COURSE SYLLABUS

Urban ecology

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 discipline «Urban ecology» is mastering theoretical backgrounds and obtaining practical skills in analysis of features, factors and functional specifics of urban ecosystems and their components.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Learning the discipline «Urban ecology» is aimed at the formation of students of thefollowing competencies:

Table 2.1. The list of competencies formed in the development of the discipline (theresults of the discipline)

Competence code	**Competence descriptor**	**Competence formation indicators** (within this course)
UK-3	Student is able to organize and lead a team, developing a team strategy to achieve thegoal.	UK-3.1 Student is able to organize team work on the project; UK-3.2 Student is able to interact with the executive authorities to coordinate all stagesof the project.
UK-6	Student is able to identify and implement the priorities of his/ her own activities and ways to improve them based on self-assessment.	UK-6.1 Student is able to plan their life activities for the period of study in an educational organization; UK-6.2 Student is able to determine thetasks of self-development and professional growth, distribute them into long-term and short-term ones with justification of their relevance and determination of the necessary resources.
GPC-3	Student is able to develop and implement new effective technologies in professional activity.	GPC-3.1 Student is able to implement new effective technologies in professional activities; GPC-3.2 Student is able to develop new effective technologies in professional activities.
PC-2	Ability to assess the effectiveness of the use of materials, equipment, technological processes in the objects of landscape architecture	PC-2.1 Student is able to assess the effectiveness of equipment use; PC-2.2 Student is able to assess theeffectiveness of technology and materials.
PC-4	Ability to implement measures for the external improvement and landscaping ofareas to create favorable sanitary and hygienic conditions, increase the level of comfort of human stay in the urban environment, its overall aesthetic enrichment	PC-4.1 Student is able to assess the environmental condition of the design object; PC-4.2 Student is able to create a project of sustainable developmentof the territory.
PC-18	Ability to prepare scientific and technical reports, reviews, publications on the results of research in the	PC-18.1 Student is able to prepare scientific articles, research reports; PC-18.2 Student is able to prepare scientific and technical reports.

Competence code	Competence descriptor	Competence formation indicators (within this course)
	field of landscape architecture	

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The discipline “Urban ecology” 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*
UK-3	Student is able to organize and lead a team, developing a team strategy to achieve thegoal.	-	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.
UK-6	Student is able to identify and implement the priorities of his/ her own activities andways to improve them 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-3	Student is able to develop and implement new effective technologies in professional activity.	-	Landscape planning and sustainable development; Phytopathology and Plant Protection; Landscape engineering and nature-based solution.
PC-2	Ability to assess the effectiveness of theuse of materials, equipment, technological processes in the objects of landscape architecture	-	-
PC-4	Ability to implement measures for the external improvement and landscaping of	-	Landscape planning and sustainable development.

Competence code	Competence descriptor	Previous courses/modules, Courses*	Subsequent courses/modules, Courses*
	areas to create favorable sanitary and hygienic conditions, increase the level of comfort of human stay in the urban environment, its overall aesthetic enrichment		
PC-18	Ability to prepare scientific and technical reports, reviews, publications on the results of research in the field of landscape architecture	-	-

4. COURSE WORKLOAD

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

5. COURSE CONTENTS

Table 5.1. Content of the discipline (module) by type of educational work (EW)

Modules	Contents (topics, types of practical activities)	Workload, academic hours
1. Properties and processes of urban ecosystems' components	Introduction in urban ecology	34
	Urbanization: problems and decisions	
	Review of functional zoning of the cities: advantages and disadvantages	
	Urban green infrastructure	
	Benefits of urban vegetation	
	Approaches to evaluation of urban trees state	
	Urban soils: variety, properties and functioning	
	Assessment of pollution level in the urban soil-vegetation system (LAB1)	
	Control and protection of the surface water quality	
	Data analysis and interpretation, presentations of the results (LAB 1)	
	Urban geomorphology	
	Review and discussion of cases of natural-based solutions in urban environment	
	Urban atmosphere and air quality	
	Assessment of pollution level in the atmosphere (analysis of snow samples) (LAB 2)	
2. Management practice in urban	2.1 Urban metabolism and waste management	34
	Data analysis and interpretation, presentations of the results (LAB 2)	

environment	2.2 Urban agriculture and food security	
	Urban farming mini-project	
	Exam and ecological assessment of the territory in urban environment (project)	
Independent work of students.		131
Control (exam/test with assessment).		17
	TOTAL:	**216**

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

The main literature:

1. Kurbatova A.S., Bashkin V.N., Kasimov N.S. «Urban ecology». – M.: 2004 – 624 p (in Russian)
2. Denisov V.V., Kurbatova A.S., Denisova I.A., Bondarenko V.L., Gracheva V.A., GutenevV.V., Nagnibeda B.A. «Ecology of a city». M.: Rostov on Don: 2008-832 p.(in Russian).
3. Alberti M. Advances in Urban Ecology: Integrating Humans and Ecological Processes inUrban Ecosystems Springer; 2008 366 p.
4. Marzluff et al (eds) 2008. Urban ecology. Springer. USA.
5. Vasenev V., Epikhina A. Urban ecology. Educational-methodological complex for masterstudents. RUDN University, 2015.

Additional literature:

1. Urban Informatics. Wenzhong Shi, Michael F. Goodchild, Michael Batty, Mei-Po Kwan, AnshuZhang (Eds.). Springer Singapore, 2021.
2. Forman R. Urban ecology: Science of Cities. 2014.
3. Urban Ecology. Pramit Verma, Pardeep Singh, Rishikesh Singh, A. Raghubanshi (Eds.). 2020

E-materials:

Resources of information and telecommunication network "Internet":

1. RUDN e-library:

RUDN electronic library system - RUDN EBS http://lib.rudn.ru/MegaPro/Web University Library Online Libraries http://www.biblioclub.ru

Yurite electronic library system http://www.biblio-online.ru Student's Consultant electronic library system www.studentlibrary.ruLan LBS http://e.lanbook.com/

2. Databases and search engines:

NCBI: https://p.360pubmed.com/pubmed/

RUDN Bulletin: access mode from the RUDN territory and remotely http://journals.rudn.ru/

Elibrary.ru scientific library: access via RUDN IP-addresses at: http://www.elibrary.ru/defaultx.asp

ScienceDirect (ESD), FreedomCollection, Cell Press of Elsevier Publishing House. There is remote access to the database, access via RUDN IP-addresses (or remotely via individual login and password).

Google Scholar is a free search engine for full-text scientific publications of all formats and disciplines. Indexes the full texts of scientific publications. Access mode:https://scholar.google.ru/

Scopus is a scientometric database of Elsevier Publishing House. Access to theplatform is via IP-addresses of PFUR or remotely. http://www.scopus.com/

Educational and methodological materials for students' individual work for acquiring skills discipline/module:*

1. Theoretical and practical information «Urban ecology» discipline in the presentations and Educational-methodological complex for master students.
2. Practical tasks

* - all educational and methodical materials for students' individual work are placed in TUIS

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		**K. V. Ivashchenko**
position, educational department	signature	name and surname.

HEAD OF EDUCATIONAL DEPARTMENT:

Director, department of landscape planning and sustainable ecosystems		**E. A. Dovletyarova**
educational department	signature	name and surname.

HEAD OF
HIGHER EDUCATION PROGRAMME:

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