

**МИНОБРНАУКИ РОССИИ**

**Федеральное государственное бюджетное образовательное  
учреждение высшего образования "Пермский  
государственный национальный исследовательский  
университет"**

**Кафедра биогеоценологии и охраны природы**

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Программа учебной практики  
**ACADEMIC PRACTICE IN URBOECOLOGY**  
Код УМК 95379

Утверждено  
Протокол №9  
от «12» мая 2020 г.

Пермь, 2020

## **1. Вид практики, способ и форма проведения практики**

Вид практики **учебная**

Тип практики **практика по получению первичных профессиональных умений и навыков**

Способ проведения практики **стационарная, выездная**

Форма (формы) проведения практики **дискретная**

## **2. Место практики в структуре образовательной программы**

Учебная практика « Academic practice in Urboecology » входит в обязательную часть Блока « Б.2 » образовательной программы по направлениям подготовки (специальностям):

Направление: **05.03.06** Экология и природопользование

направленность Экологическая инженерия и новая энергетика

### **Цель практики :**

Formation of skills for planning, organizing and conducting field and laboratory work, measures for managing and optimizing environmental management in an urban environment, acquisition of practical mapping skills in the field of urban ecology, conducting excursions to economic objects that ensure the functioning of the urban environment

### **Задачи практики :**

- \* To develop skills in collecting and analyzing stock and literary materials in the field of urban ecology;ogy;
- \* To form ideas about the modern system of exploitation of natural resources in the urban environment;
- \* To form ideas about the modern system of environmental protection in urbanized areas;
- \* Master key diagnostic methods for monitoring the state of the environment in the city;
- \* To study the main methods of rationing and assessing the state of the environment in urbanized areas.

### **3. Перечень планируемых результатов обучения**

В результате прохождения практики **Academic practice in Urboecology** у обучающегося должны быть сформированы следующие компетенции:

**05.03.06** Экология и природопользование (направленность : Экологическая инженерия и новая энергетика)

**ПК.2** иметь навыки идентификации организмов, описания биологического разнообразия и его оценки современными количественными методами

#### 4. Содержание и объем практики, формы отчетности

The Education practice involves a wide range of excursions to study the basics of urban ecology: assessment of the environmental situation in the urban environment, design and planning of the urban environment, obtaining practical skills of an ecologist with elements of engineering work and the ability to plan and implement professional activities.

<b>Направления подготовки</b>	05.03.06 Экология и природопользование (направленность: Экологическая инженерия и новая энергетика)
<b>форма обучения</b>	очная
<b>№№ триместров, выделенных для прохождения практики</b>	3
<b>Объем практики (з.е.)</b>	3
<b>Объем практики (ак.час.)</b>	108
<b>Форма отчетности</b>	Экзамен (3 триместр)

#### Примерный график прохождения практики

Количество часов	Содержание работ	Место проведения
Scientific foundations of urboecology		
20	This section considers the modern system of exploitation of natural resources and environmental protection in urbanized territories; key diagnostic methods for monitoring the state of the environment in urban conditions; the main methods of rationing and assessing the state of the environment in urbanized territories.	Conducting field tours of urbanized landscapes within the Perm Region (Approximate locations: Perm, Kungur, Solikamsk). The forms of practical training for persons with disabilities are determined taking into account the peculiarities of psychophysiological development, individual capabilities and the state of health of students. There may be changes in the time frame for passing the current interim certification, namely, an increase in the time for preparing and submitting the practice report is provided.
Anthropogenic changes in the components of the city environment		
20	Training in occupational safety and health. Introduction to the general principles of working in the laboratory, tasks to be solved, laboratory equipment and devices.	Conducting field tours of urbanized landscapes within the Perm Region

Количество часов	Содержание работ	Место проведения
	<p>During the routes in urbanized areas, the main components of urban landscapes are described, special attention is paid to their modified natural components: soils, vegetation cover, water bodies, etc.; description forms are compiled, field material is collected, and photo fixation is carried out.</p>	<p>(Approximate locations: Perm, Kungur, Solikamsk). The forms of practical training for persons with disabilities are determined taking into account the peculiarities of psychophysiological development, individual capabilities and the state of health of students. There may be changes in the time frame for passing the current interim certification, namely, an increase in the time for preparing and submitting the practice report is provided.</p>
Sustainable development and ecological balance of cities		
20	<p>The methods of maintaining ecological balance in cities that ensure self-restoration and self-purification of the natural environment, that is, the equilibrium state between nature and the city, due to compliance with the conditions of dynamic equilibrium, are considered:</p> <ul style="list-style-type: none"> <li>- anthropogenic changes should not have the character of catastrophes leading to new environmental crises;</li> <li>- anthropogenic changes should be gradual, ensure the correct distribution and strength of anthropogenic loads and the necessary conditions for the adaptation of humans and the natural environment to them.</li> </ul> <p>It also gives an idea of the methods of constructing an environmentally balanced structure of urbanized territories.</p>	<p>Conducting field tours of urbanized landscapes within the Perm Region (Approximate locations: Perm, Kungur, Solikamsk). The forms of practical training for persons with disabilities are determined taking into account the peculiarities of psychophysiological development, individual capabilities and the state of health of students. There may be changes in the time frame for passing the current interim certification, namely, an increase in the time for preparing and submitting the practice report is provided.</p>
Green technologies in the ecological development of cities		
22	<p>The article considers the technologies and methods used to ensure a comfortable and sustainable urban environment, ensuring a balance between the sustainability of the natural environment and the needs of the urban population. Excursions to enterprises and</p>	<p>Conducting excursions to objects and enterprises within the Perm Region (Approximate places of</p>

Количество часов	Содержание работ	Место проведения
	facilities using "green" technologies are carried out.	<p>excursions: LLC "Novogor-Prikamye", Perm; Biological treatment facilities, Perm; Kamskaya HPP).</p> <p>The forms of practical training for persons with disabilities are determined taking into account the peculiarities of psychophysiological development, individual capabilities and the state of health of students.</p> <p>There may be changes in the time frame for passing the current interim certification, namely, an increase in the time for preparing and submitting the practice report is provided.</p>
Preparation and defense of the practice report		
26	Preparation and defense of the final report on the academic practice.	Perm State University, Department of Biogeocenology and Nature Protection.

## **5. Перечень учебной литературы, необходимой для проведения практики**

### **Основная**

1. Myrna H. P. Hall, Understanding Urban Ecology. An Interdisciplinary Systems Approach / Myrna H. P. Hall, Stephen B. Balogh // Springer, Cham, 2019. — 360 p. — ISBN 978-3-030-11259-2. — Текст : электронный // Электронно-библиотечная система SpringerLink : [сайт]. <https://link.springer.com/book/10.1007/978-3-030-11259-2>
2. Arup K. Sarma, Vijay P. Singh, Rajib K. Bhattacharjya, Suresh A. Kartha. Urban Ecology, Water Quality and Climate Change. Springer, Cham, 2018. Online ISBN 978-3-319-74494-0. Текст электронный. <https://link.springer.com/book/10.1007/978-3-319-74494-0>

### **Дополнительная**

1. Robert A. McCleery, Christopher E. Moorman, M. Nils Peterson. Urban Wildlife conservation. Theory and Practice. Springer, Boston, MA, 2014. Online ISBN 978-1-4899-7500-3. Текст электронный. <https://link.springer.com/book/10.1007/978-1-4899-7500-3>
2. Nickolas J. Themelis, A.C. (Thanos) Bourtsalas. Recovery of Materials and Energy from Urban Wastes. A Volume in the Encyclopedia of Sustainability Science and Technology, Second Edition. Springer Science+Business Media LLC, part of Springer Nature 2019. Online ISBN 978-1-4939-7850-2. Текст электронный: // <https://link.springer.com/referencework/10.1007/978-1-4939-7850-2>  
<https://link.springer.com/referencework/10.1007/978-1-4939-7850-2>

## **6. Перечень ресурсов сети «Интернет», требуемых для проведения практики**

При прохождении практики требуется использование следующих ресурсов сети «Интернет» :

<https://www.researchgate.net/topics> ResearchGate

<https://elibrary.ru> Scientific Electronic Library

<https://cyberleninka.ru> Scientific electronic Library " CYBERLENINKA»

## **7. Перечень информационных технологий, используемых при проведении практики**

Образовательный процесс по практике **Academic practice in Urboecology** предполагает использование следующего программного обеспечения и информационных справочных систем:

List of required licensed and / or freely distributed software:

1) office suite of applications (word processor, program for preparing electronic presentations);

2) video demonstration program (player);

3) An application that allows you to view and play the media content of PDF files.

Presentation materials (slides on the topics of lectures and practical classes); on

-line access to the Electronic Library System;

access to the electronic information and educational environment of the university.

Internet services and electronic resources (search engines, e-mail, professional thematic chats and forums, audio and video conference systems, online encyclopedias, etc. )

Office application package "LibreOffice". Programs, demonstrations of video materials (player).

Software for a laptop: OS "Alt Education" (Contract No. DS 003-2020). The

discipline does not provide for the use of specialized software

При освоении материала и выполнения заданий по дисциплине рекомендуется использование материалов, размещенных в Личных кабинетах обучающихся ЕТИС ПГНИУ ([student.psu.ru](http://student.psu.ru)).

При организации дистанционной работы и проведении занятий в режиме онлайн могут использоваться:

система видеоконференцсвязи на основе платформы BigBlueButton (<https://bigbluebutton.org/>).

система LMS Moodle (<http://e-learn.psu.ru/>), которая поддерживает возможность использования текстовых материалов и презентаций, аудио- и видеоконтент, а так же тесты, проверяемые задания, задания для совместной работы.

система тестирования Indigo (<https://indigotech.ru/>).

## **8. Описание материально-технической базы, необходимой для проведения практики**

For seminars (practical) type, group and individual consultations and intermediate certification-an audience equipped with presentation equipment (projector, screen, laptop) with appropriate software; chalk or marker board.

Independent work: An audience for independent work, equipped with computer equipment with the ability to connect to the Internet, provided with access to the electronic information and educational environment of the university.

Premises of the Scientific Library of PSU.

Facilities for storage and preventive maintenance of educational equipment



Specialized equipment: Compass, field diary, colored pencils, folding meter, shovels, knives, soil drill, camera, bags and labels for sampling, tarpaulin, 10% HCl solution, kappameter, protractor, 20 m tape measure, GPS-navigators, binoculars.

For field practices - equipment provided by the organization.

Помещения научной библиотеки ПГНИУ для обеспечения самостоятельной работы обучающихся:

1. Научно-библиографический отдел, корп.1, ауд. 142. Оборудован 3 персональными компьютера с доступом к локальной и глобальной компьютерным сетям.

2. Читальный зал гуманитарной литературы, корп. 2, ауд. 418. Оборудован 7 персональными компьютерами с доступом к локальной и глобальной компьютерным сетям.

3. Читальный зал естественной литературы, корп.6, ауд. 107а. Оборудован 5 персональными компьютерами с доступом к локальной и глобальной компьютерным сетям.

4. Отдел иностранной литературы, корп.2 ауд. 207. Оборудован 1 персональным компьютером с доступом к локальной и глобальной компьютерным сетям.

5. Библиотека юридического факультета, корп.9, ауд. 4. Оборудована 11 персональными компьютерами с доступом к локальной и глобальной компьютерным сетям.

6. Читальный зал географического факультета, корп.8, ауд. 419. Оборудован 6 персональными компьютерами с доступом к локальной и глобальной компьютерным сетям.

Все компьютеры, установленные в помещениях научной библиотеки, оснащены следующим программным обеспечением:

Операционная система ALT Linux;

Офисный пакет Libreoffice.

Справочно-правовая система «КонсультантПлюс»

## **9. Методические указания для обучающихся по освоению дисциплины**

At the end of the training practice, students make up and hand over to the supervisor a report with the results of the work performed during the internship.

The report contains the following sections: title page; content; introduction; description of the place of practice, visited objects; practical options for implementing the project; results of the work carried out (cartographic materials, route characteristics, results of studying key areas, description forms, etc.); conclusion, which contains conclusions on the implementation of the tasks assigned to the practice and possible suggestions for improving its organization; review of the head of the practice from the organization (if available); review of the head of the practice from the department. The report on the implementation of the practice is submitted in typewritten form, designed in accordance with the standards for the design of reports.

## Фонды оценочных средств для проведения промежуточной аттестации

### Планируемые результаты обучения по дисциплине для формирования компетенции. Индикаторы и критерии их оценивания

#### ПК.2

**иметь навыки идентификации организмов, описания биологического разнообразия и его оценки современными количественными методами**

Компетенция	Планируемые результаты обучения	Критерии оценивания результатов обучения
<p><b>ПК.2</b> иметь навыки идентификации организмов, описания биологического разнообразия и его оценки современными количественными методами</p>	<p>KNOW: the modern system of environmental protection in urbanized areas; the modern system of exploitation of natural resources in urban landscapes. BE ABLE TO: collect and analyze stock and literary materials in the field of urban ecology; identify and diagnose problems of nature protection in urban areas, develop practical recommendations for the preservation of the natural and quasi-natural environment. POSSESS: key methods of diagnostics and control of the state of natural and anthropogenic complexes; methods of assessment of the ecological situation in the places of residence.</p>	<p style="text-align: center;"><b>Неудовлетворительно</b></p> <ul style="list-style-type: none"> <li>• Has no idea about the modern system of exploitation of natural resources in the urban environment;</li> <li>• Has no idea about the modern system of environmental protection in urbanized areas;</li> <li>* Does not know the methods of diagnostics for monitoring the state of the environment in the city;</li> <li>* Does not know the methods of rationing and assessing the state of the environment in urbanized areas.</li> </ul> <p style="text-align: center;"><b>Удовлетворительно</b></p> <ul style="list-style-type: none"> <li>* Has an understanding of the modern system of exploitation of natural resources in the urban environment;</li> <li>* Has an understanding of the modern system of environmental protection in urbanized areas;</li> <li>* Generally knows the methods of diagnostics for monitoring the state of the environment in the city;</li> <li>* Generally knows the methods of rationing and assessing the state of the environment in urbanized areas.</li> </ul> <p style="text-align: center;"><b>Хорошо</b></p> <ul style="list-style-type: none"> <li>* Has an understanding of the modern system of exploitation of natural resources in the urban environment;</li> <li>* Has an understanding of the modern system of environmental protection in urbanized areas;</li> <li>* Knows well the methods of diagnostics and monitoring of the state of the environment in the city;</li> <li>* Knows well the methods of rationing and assessing the state of the environment in urbanized areas.</li> </ul> <p style="text-align: center;"><b>Отлично</b></p>

		<p style="text-align: center;"><b>Отлично</b></p> <ul style="list-style-type: none"> <li>* Has a stable knowledge of the modern system of natural resources exploitation in the urban environment;</li> <li>* Has a stable knowledge of the modern system of environmental protection in urbanized areas;</li> <li>* Methods of diagnostics of environmental monitoring in urban conditions have been mastered;</li> <li>* Methods of rationing and assessment of the state of the environment in urbanized areas have been mastered.</li> </ul>
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### Оценочные средства

**Вид мероприятия промежуточной аттестации :** Экзамен

**Способ проведения мероприятия промежуточной аттестации :** Письменное контрольное мероприятие

**Продолжительность проведения мероприятия промежуточной аттестации :**

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### Показатели оценивания

<p>Has no idea about the modern system of exploitation of natural resources in the urban environment;</p> <p>Has no idea about the modern system of environmental protection in urbanized areas;</p> <p>Does not know the methods of diagnostics monitoring the state of the environment in the city;</p> <p>Does not know the methods of rationing and assessing the state of the environment in urbanized areas.</p>	<b>Неудовлетворительно</b>
<p>Has an idea of the modern system of exploitation of natural resources in the urban environment;</p> <p>Has an idea of the modern system of environmental protection in urbanized areas;</p> <p>In general, he knows the methods of diagnostics and control of the state of the environment in the city;</p> <p>In general, he knows the methods of rationing and assessing the state of the environment in urbanized areas.</p>	<b>Удовлетворительно</b>
<p>Has an idea of the modern system of exploitation of natural resources in the urban environment;</p> <p>Has an idea of the modern system of environmental protection in urbanized areas;</p> <p>He/she knows well the methods of diagnostics and control of the state of the environment in the city;</p> <p>He/she knows well the methods of rationing and assessing the state of the environment in urbanized areas.</p>	<b>Хорошо</b>
<p>Has a stable knowledge of the modern system of exploitation of natural resources in the urban environment;</p>	<b>Отлично</b>

Has a stable knowledge of the modern system of environmental protection in urbanized areas;  
Methods of diagnostics of control of the state of the environment in the city conditions are mastered;  
Methods of rationing and assessment of the state of the environment in urbanized areas have been mastered.

**Отлично**