

I. Institution

1. Institution's name	St. Petersburg State University
2. Faculty (department)	Geological faculty, department of Ecological geology
3. Postal address	199034, Russia, St. Petersburg, Universitetskaya naberezhnaya 7/9, St. Petersburg State University
4. Contact person/coordinator	Prof. Kurilenko V.V. (812) 329-94-66, fax (812) 328-95-35 abel@le8088.spb.edu

II. Course's profile

5. Course's name	Geocology of the urban and industrial agglomerations
6. Course's profile	Ecological geology
7. Possibility to get the ECTS points	no
8. Class hours/week	4 weeks
9. Attached Russian language course for beginners	no
10. Language of instruction	English and German
11. Attached practical training/research program	yes
12. Attached cultural program: excursions etc.	yes
13. Number of students (min-max)	10 - 20
14. Tuition fees (euro/month/person)	Course - 350 (euro/month/person) Field trip and cultural excursions - 250 (euro/month/person)
15. Course's duration	4 weeks

III. Accommodation

17. Accommodation conditions: student hostel	student hostel of the St. Petersburg State University 15\$/ person/day
18. Accommodation conditions: guest family	student hostel of the St. Petersburg State University 15\$/ person/day
19. Accommodation conditions during fieldwork	student hostel of the St. Petersburg State University 15\$/ person/day

Additional description of the course

Program of the practice for German students on the Geological Faculty of St. Petersburg State University GEOECOLOGY OF THE URBAN AND INDUSTRIAL AGGLOMERATIONS

1. Requirements to German students to enter the proposed course:

This is a course for continuing students or graduate students;

The students should have knowledge of geology, geography, soil science, biology and environmental science.

The number of students is 10 – 20 persons.

As is expected, there will be not many Russian-speaking students. So, the interpreters for the German translation will be engaged.

2. Description of the curriculum

Geoecology of the urban and industrial agglomerations

The curriculum provides for 4 – 6 academic hours a day and includes short introduction course of lectures, field research and excursions. There are activities on regional study and cultural program. The course will be conducted by high-qualified lecturers of St. Petersburg State University (Associate Professors and Professors of the Department of Ecological Geology of the Geological Faculty and Biological Faculty).

Contents of the Course

The aim of the course is familiarization of the German students with methods of the stability assessment for urban and industrial agglomerations on the case study of St. Petersburg and St. Petersburg Region. The main task of the course is a student training in field methods of the study of different natural media in conditions of high anthropogenic pressure: rocks, ores, loose grounds and soils, organic matter, groundwater, water reservoirs and bottom sediments, biological variety of the environment and biotesting of the ecological systems in contaminated water.

Within the course, the students will study the behavior of the natural and anthropogenic substances, i.e. their concentration, accumulation, decay processes. Investigations of migration properties of chemical compounds will be also carried out. Another important element of the course is revealing of the degree, consequences and forms of the negative impact (quantitative and qualitative) of the accumulating chemicals within urban ecosystems and revealing of their possible functional disturbance.

To reveal the regularities of the contaminants' migration in the stressed components of urban ecosystems, the students will choose representative test sites for the development of the rational complex and sequence of the applied geochemical, biogeochemical, bioindicative and biotesting methods of the assessment of the functioning of investigated urban ecosystems.

For this purpose, the students will study the ranking principals for the applied geological, geochemical and bioindicative methods according to the significance of the obtained information to define the possibility of the application of these methods when zoning the megapolis area on the degree of environmental tensity.

The course provides the investigation of urban ecosystems on the case study of St. Petersburg and St. Petersburg Region on the basis of monitoring research.

The students will solve the next problems:

- Application of the integral assessment criteria of the present environmental state of the urban area based on the complex use of methods, applied in geology, geography and biology.
- Revealing of the system-forming functional connections between abiotic and biotic components of the

studied objects.

- Justification of the functioning mechanisms of urban ecosystems considering their stability assessment in conditions of technogenic pressure.

Chapters of the course (4 weeks)

1. Theoretical lectures on the fundamentals of environmental geology.
2. Excursions and practical training on environmental geology.
3. Training on field methods of the study of different natural media with high anthropogenic pressure.
4. Analysis of obtained results and preparation of the final report.

Plan of the course:

1. Arrival to St. Petersburg, accommodation, instructions on the accident prevention.
2. Cultural program, acquaintance with St. Petersburg and St. Petersburg State University (6 hours).

Theoretical lectures on the fundamentals of environmental geology

3. Introduction lecture about aims and content of the course - 2 hours.
4. Lecture on the fundamentals of the new science – environmental geology – 2 hours.
5. Lecture “Environmental geology of towns and industrial mining areas of Russia”- 2 hours.
Acquaintance with Departments and laboratories of the Geology Faculty of St. Petersburg University - 2 hours.
Cultural program – acquaintance with architecture and facing stone of St. Petersburg - 2 hours.
6. Continuing the lecture “Environmental geology of towns and industrial mining areas of Russia”- 4 hours.
Cultural program – excursion to State Hermitage.
7. Free time. Cultural program – acquaintance with architecture and construction rocks of St. Petersburg - 4 hours.
8. Free time. Cultural program – acquaintance with historical and cultural monuments of St. Petersburg - 4 hours.

Excursions and practical training on environmental geology.

9. Bus excursion to the town of Kronstadt (Kotlin island) along the barrage that is built in the Gulf of Finland to protect St. Petersburg from high water. Cultural program – excursion around Kronstadt.
10. Excursion on the incineration plant (Bely island).
11. Excursion around St. Petersburg for the acquaintance with natural facing stone use in the construction.
Cultural program – visit to Alexander Nevsky Lavra (Monastery)
12. Introduction lecture about Sablino geological site and geology of the area. Excursion on the basic cross-sections of Paleozoic and Quaternary sediments. Basic information about modern geological processes and geological history of the area.
13. Description of the basic cross-sections in Sablino geological site, sampling, observations of modern geological processes, radiometric observations. Office studies of the materials.
14. Free day. Cultural program – excursions around St. Petersburg, visiting museums and theaters of the city.
15. Free day. Cultural program – excursions around St. Petersburg, visiting museums and theaters of the city.
16. Excursion to the toxic waste disposal “Krasny Bor”.
17. Introduction lecture and practical training on the study of the environmental state of small water reservoirs of St. Petersburg.
18. Introduction lecture and practical training on the study of the composition of bottom sediments of small water reservoirs of St. Petersburg.
19. Introduction lecture and practical training on the bioindication methods of the study of water reservoirs of St. Petersburg.

20. Introduction lecture and practical training on the phytointication methods of the study of forest vegetation of St. Petersburg.
21. Practical training on the bioindication methods of the study of water reservoirs of St. Petersburg.
22. Free day. Cultural program – excursions around St. Petersburg, visiting museums and theaters of the city.
23. Free day. Cultural program – excursions around St. Petersburg, visiting museums and theaters of the city.
24. Environmental geological excursion to the quarries and plant of JV “Phosphorit”.
25. Environmental geological excursion to the quarries and plant for the processing of shale oil.
26. Excursion to the town of Boksitogorsk.
27. Analysis of the collected data, preparation of the final report.
28. Free day. Cultural program – excursions around St. Petersburg, visiting museums and theaters of the city.
29. Departure.

After the graduation of the course, the **graduation certificate** will be given to the students.

The scientific supervisor of the course **Geoecology of the urban and industrial agglomerations** is Head of the Department of Ecological Geology of the Geological Faculty of St. Petersburg State University, Doctor of Geology, Professor V.V. Kurilenko.