



Pre-diploma practice

Working program of practice (Syllabus)

Details of the academic discipline

Level of higher education	<i>First (undergraduate)</i>
Branch of knowledge	<i>10 Natural sciences</i>
Specialty	<i>101 Ecology</i>
Educational program	<i>Ecological safety</i>
Discipline status	<i>Normative</i>
Form of education	<i>full-time (day)/distance/mixed</i>
Year of training, semester	<i>4th year, 6th semester</i>
Scope of the discipline	<i>6 credits, 180 hours</i>
Semester control/ control measures	<i>Test</i>
Timetable	<i>According to the curriculum</i>
Language of teaching	<i>Ukrainian</i>
Information about the course leader	Viktoria Oleksiivna, responsible for organizing Ovsyankin's practice: https://eco-paper.kpi.ua/pro-kafedru/vykladachi/ovsyankina-viktoriya-oleksijivna.html Practice managers: https://eco-paper.kpi.ua/pro-kafedru/vykladachi
Placement of the course	https://eco-paper.kpi.ua/navchannia/praktyka.html

Program of educational discipline

1. Description of the educational discipline, its purpose, subject of study and learning outcomes

Pre-diploma practice is a mandatory educational component for obtaining a bachelor's degree in the specialty 101 - Ecology, in the Environmental Safety educational program.

Pre-diploma practice is aimed at systematization, expansion and consolidation of professional knowledge, formation of students' initial competencies for conducting independent design and construction work.

The main content of the pre-diploma practice consists in involving students in independent analytical and design work, familiarization with technological processes at various enterprises, issues of implementation of theoretical and practical developments in the field of their professional activity.

The subject of pre-diploma practice of bachelors is deepening the skills of independent theoretical and practical work, broadening the worldview of students, researching practical problems and the ability to connect them with the chosen direction, to determine the structure and logic of the future diploma project.

The purpose of pre-diploma practice in the specialty 101 – Ecology is to form the following competencies in students:

- *knowledge and understanding of the subject area and professional activity;*
- *ability to adapt and act in a new situation;*
- *the ability to communicate in the state language both orally and in writing;*

- *the ability to communicate with representatives of other professional groups of different levels (with experts from other fields of knowledge/types of economic activity);*
- *the ability to act socially responsibly and consciously;*
- *the ability to conduct research at the appropriate level;*
- *ability to work in a team;*
- *interpersonal skills;*
- *the ability to evaluate and ensure the quality of performed works;*
- *the ability to assess the impact of technogenesis processes on the state of the environment and identify environmental risks associated with production activities;*
- *the ability to use the basic principles and components of environmental management;*
- *the ability to conduct environmental monitoring and assess the current state of the environment;*
- *the ability to participate in the development of a management system and handling of production and consumption waste;*
- *the ability to use modern information resources for environmental research;*
- *the ability to master international and domestic experience in solving regional and cross-border environmental problems;*
- *the ability to participate in the management of environmental actions and/or environmental projects;*
- *the ability to develop project and working technical documentation in the field of environmental protection technologies, to draw up structural schemes with elements of equipment and industrial buildings, to draw up completed design and construction developments;*
- *the ability to distinguish the technological processes of production, to determine the sources and ways of entering the natural environment of harmful components, to assess their impact on the state of human health and the quality of the environment.*

According to the requirements of the pre-diploma practice program , after completing it , students must demonstrate the following learning outcomes :

- *demonstrate an understanding of the basic principles of managing environmental actions and/or environmental projects;*
- *understand basic environmental laws, rules and principles of environmental protection and nature management;*
- *understand the main concepts, theoretical and practical problems in the field of natural sciences, which are necessary for analysis and decision-making in the field of ecology, environmental protection and optimal use of nature;*
- *use management principles on which the environmental safety system is based;*
- *to know the conceptual bases of monitoring and regulation of anthropogenic load on the environment;*
- *identify factors that determine the formation of landscape and biological diversity;*
- *solve problems in the field of environmental protection using generally accepted and/or standard approaches and international and domestic experience;*
- *be able to search for information using appropriate sources for making informed decisions;*
- *demonstrate the skills of assessing unpredictable environmental problems and deliberate choice of ways to solve them;*
- *be able to use software tools, GIS technologies and Internet resources for Information Support of environmental research;*
- *be able to predict the impact of technological processes and production on the environment;*
- *participate in the development and implementation of projects aimed at optimal management and handling of industrial and municipal waste;*
- *be able to form effective communication strategies in order to convey ideas, problems, solutions and own experience in the field of ecology;*
- *be able to convey the results of activities to a professional audience and the general public, make presentations and messages;*

- *be able to explain the social, economic and political consequences of implementing environmental projects;*
- *choose the optimal strategy for conducting public hearings regarding problems and formation of the territories of the nature reserve fund and ecological network;*
- *to be aware of the responsibility for the effectiveness and consequences of the implementation of complex environmental protection measures;*
- *combine the skills of independent and teamwork to achieve results with an emphasis on professional integrity and responsibility for decision-making;*
- *be able to choose optimal methods and tools for research, data collection and processing;*
- *participate in the development of projects and practical recommendations for environmental protection;*
- *demonstrate skills in implementing environmental protection measures and projects;*
- *apply methodologies and technologies of design, implementation and implementation of environmental protection technologies and equipment, carry out design and construction activities;*
- *carry out technological and hydraulic calculations of treatment facilities, draw up the energy and material balance of devices, perform parametric calculation of equipment, choose typical structures in construction, draw up master plans of industrial enterprises;*
- *carry out an assessment of the state of the environment, determine the level of impact of the enterprise (production) on the environment, determine the main polluters of the environment of this enterprise (production);*
- *develop technologies, use processes and devices that ensure effective separation, concentration, extraction, destruction of harmful impurities in water systems and gas environments, processing and disposal of waste.*

2. Pre-requisites and post-requisites of the discipline (place in the structural and logical scheme of training according to the relevant educational program)

Completion of pre-diploma practice is based on the knowledge acquired by students in basic professional disciplines. Pre-diploma practice is the foundation for preparing students for the implementation of a diploma project (Diploma Design) or for other forms of graduation certification.

To successfully pass the pre-diploma practice, students must master the main professional and general disciplines in the specialty 101 – Ecology: History of science and technology, Foreign language of professional direction, Economics and organization of production, Labor protection and civil protection, Informatics and systematics, Geodynamics of the ecological environment, Hydrology, Meteorology and climatology, Chemistry with the basics of biogeochemistry, Human ecology, Environmental monitoring, Modeling and forecasting of the state of the environment. Basics of GIS, Technoecology, Normation of anthropogenic load on the environment, Ecological and natural-technogenic safety, Organization and management of environmental protection activities, General ecology, Utilization and recovery of waste, Analytical chemistry, Course project on technologies and design of industrial production, Course project on atmospheric protection .

3. Content of practice

Pre-diploma practice consists of the following stages (the stages and their sequence may be changed depending on the conditions of the individual task):

- *receiving an individual assignment and practice schedule, familiarization with the practice program;*
- *training on practical training, safety training (in the case of face-to-face training);*
- *theoretical study of technological processes, productions, specific enterprises (depending on the individual task);*

- detailed analysis and study of the main pollutants and factors of negative impact of a specific process, production or enterprise;
- study of the main factors of water pollution, formation of atmospheric emissions, formation of solid industrial (household) waste;
- a description of the main processes implemented in the defined technological scheme (production process, etc.);
- characteristics of negative effects on the environment and human health of compounds formed in the specified technological process (at a separate enterprise, etc.);
- search and analysis of modern technologies that can improve (improve certain indicators) a separate technological process (technology, production, etc.);
- drawing up conclusions regarding the possibility (feasibility) of modernization of the enterprise (individual technological scheme, process, etc.);
- design of a practice diary;
- drawing up a practice report;
- protection of practice results.

Before completing the internship, students must undergo training on the internship, safety techniques and fire prevention (in the case of full-time internship format). Before practice, students receive an individual task from the practice supervisors of the department, by completing which, students get to know and study in detail the specified process or operation of equipment (technological scheme or work of a separate enterprise), quality control methods of sewage treatment at one of the stages of treatment, measures for the rational use of natural resources and environmental protection, etc. By completing an individual task, students expand their engineering and technical outlook, gain experience and specialist qualifications. Also, students get acquainted with the technological scheme of sewage treatment at sewage treatment plants, with the equipment involved in the scheme, its structural and technological features, advantages and disadvantages, make sketch drawings (if necessary) of the main equipment, nodes and blocks of the scheme.

During the pre-diploma practice, students collect the necessary material for the completion of an individual assignment and diploma project (preparing for other forms of graduation certification).

4. Educational materials and resources

Basic literature

1. Provisions on internships for students of higher educational institutions of Ukraine: Order of the Ministry of Education of Ukraine dated April 8, 1993 No. 93.
2. Methodological recommendations on issues of organization of students' practice and drawing up work programs of practice of the National Technical University of Ukraine "Ihor Sikorskyi Kyiv

Polytechnic Institute" [Text] / Composer: N.M. Lapenko, I.L. Spivak, I.V. Fedorenko, O.M. Shapovalova; in general ed. P.M. Yablonsky. - K.: KPI named after Igor Sikorskyi, 2018. – 29 p.

3. *Methodological recommendations for the implementation of the work program of pre-diploma practice for students of the 4th year of the specialty 101 "Ecology".*

Additional literature

4. *Radovenchyk V.M., Gomelya M.D., Radovenchyk Y.V. Utilization and recovery of waste / Textbook. - Kyiv: Condor, 2021. - 246 p.*

5. *Sarapina M. V. Processes and devices for dust and gas cleaning: a course of lectures. Kharkiv: NUZZU, 2018. 125 p.*

6. *Technoecology: a textbook / O.I. Ivanenko, Yu.V. Nosachova — Kyiv: "Condor" Publishing House, 2017. — 294 p.*

7. *Environmental safety: a study guide / Krasnyanskyi M.Yu. - K.: "Condor" Publishing House, 2018. - 180 p.*

8. *Trus I.M., Galysh V.V., Skyba M.I., Radovenchyk Y.V., Homelya M.D. New highly effective methods of cleaning from soluble and insoluble pollutants: monograph. / – K.: Condor Publishing House, 2020. – 272 p.*

9. *Shadura V.O., Kravchenko N.V. Water supply and drainage: study guide - Rivne: NUVHP, 2018. - 343 p.*

10. *Radovenchyk, J.V., Gomelya, M.D. Physico-chemical methods of water purification. Textbook. - K.: Condor Publishing House, 2016. - 264 p.*

11. *Gomelya M.D., Shablii T.O., Radovenchyk Y.V. Physico-chemical basics of water purification processes: a textbook. - K.: Condor Publishing House, 2019. - 256 p.*

12. *Radovenchik V.M. Basics of land hydrology and oceanology / V.M. Radovenchyk, M.D. Gomelya, Yu.A.*

Omelchenko. - Sevastopol: SNUYAE and P, 2018. - 176 p.

13. *Krusir G. V., Madani M. M., Harkovych O. L. Techniques and technologies for cleaning gas emissions. Odesa: ONAKHT-Odesa, 2017. 207 p.*

14. *Beketov V. E., Yevtukhova H. P. Sources and processes of atmospheric pollution. Kharkiv: XNUMX named after O. N. Beketova, 2019. 113 p.*

Information resources on the Internet

15. *Scientific and technical library named after G.I. Denisenko KPI named after Igor Sikorsky - <http://www.library.kpi.ua>*

16. *Electronic archive of KPI named after Igor Sikorsky - <http://www.ela.kpi.ua>*

17. *Department of Ecology and Technology of Plant Polymers KPI named after Igor Sikorskyi - <https://eco-paper.kpi.ua>*

18. *Industrial ecology. Community of ecologists - <http://www.eco.com.ua/>*

19. *Professional Association of Environmentalists of Ukraine (PAEU) - <https://paeu.com.ua/>*

Educational content

5. Independent work of the student, consultations on pre-diploma practice

The student's independent work during the pre-diploma internship takes 100% of the time allocated for the internship. The main task of independent work is the fulfillment of all the points specified in the individual task. The student independently processes and prepares materials, conducts a literature search, analyzes and compares the received information. The student independently prepares a practice report.

8	6	180	-	-	-	180	-	-	test
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The student's rating during the pre-diploma practice consists of additional (incentive) points (no more than 15 points) that he receives during the practice and points he receives when passing the practice credit.

Semester control is credit.

No later than a week after the end of the internship, the student passes the assessment on the internship to the commission, which consists of the supervisor of the student's internship, supervisors of other students and teachers of the department. The composition of the commission is formed by the head of the department. In order to be allowed to pass the test, the student must fill out and sign the practice diary with the supervisor, prepare a report on the practice. The student must complete the diary and report and hand it over to the supervisor for review.

The grade from the practice is taken into account along with other grades that characterize the success of the students. The results of passing practical tests are entered in the examination information, put in the test book and in the journal of success. A student who did not complete the internship program, or received negative feedback from the internship supervisor or did not pass the test, is sent to internship a second time during the vacation period, or is expelled from the university.

The rating system of assessment when passing a credit on pre-diploma practice:

- 100-95 points – the student provided the most clear, correct and comprehensive answers to all the questions posed by the representatives of the commission; the student submitted the report and diary for review on time; the quality of the execution of the report received the highest rating from the head of the practice; the student did not receive any comments during the entire period of pre-diploma practice.

- 94-80 – the student gave complete answers to most of the questions, but there are some inaccuracies in the answers; the report has flaws in the design or structure of the work; the report does not contain all the necessary information; no more than 80% of the individual task is completed; in general, there are no significant comments to the student.

- 79-60 – individual task completed by no more than 60-70%; the student cannot provide clear answers to the committee's questions; the report contains significant errors or is missing significant amounts of required information.

To obtain a passing grade, the sum of all received rating points is translated according to the table:

Scores	Rating
95...100	perfectly
85...94	very well
75...84	okay
65...74	satisfactorily
60...64	enough
RD <60	unsatisfactorily
Admission conditions not met	not allowed

Working program of pre-diploma practice (syllabus):

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Approved by the EtaTRP department (protocol No. 14 dated 06/08/2022)

Agreed by the IHF Methodical Commission (protocol No. 10 dated 06/24/2022)

