SYLLABUS OF THE ACADEMIC DISCIPLINE
«SPECIAL BUILDING GEOTECHNOLOGIES»

Academic degree	**Bachelor**
Academic program	**184 Mining,** **192 Building and Civil Engineering**
Duration	4 quarter
Classes:	Spring semester
Lectures	2 hours
Practical	1 hour
Language	English
Department	Construction, geotechnics and geomechanics

Distance courses:
https://do.nmu.org.ua/course/view.php?id=3377

Consultations: according to a separate schedule agreed with the applicants for higher education

Online consultations: Microsoft Teams – group «SBG» (according to the schedule agreed with the applicants for higher education)

Information about lecturers:

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1. Course abstract

Special building geotechnologies are acquaintance of higher education seekers with the most effective methods and special technologies of construction of underground objects in severe mining-geological and hydrogeological conditions.

The studied technologies can be used in the construction of both mine excavations and underground facilities for various purposes, in unstable soils and in strong fractured rocks.

Considerable attention is paid to new technical solutions, which ensure the possibility of technological operations, safety of their implementation and optimal organization of work.

2. The purpose and objectives of the discipline

The purpose of the discipline is to form competencies in the design of technologies for the construction of workings and facilities in severe mining-geological and hydrogeological conditions using modern methods and special equipment.

Course objectives:

- to acquaint applicants of higher education with types of underground buildings and engineering constructions, special technologies of construction of underground objects according to their mining-geological and hydrogeological conditions of construction;
- consider a set of modern special technologies for the construction of underground objects, organization and safety measures in the performance of these works;
- to study the features of construction work for objects that are built in severe conditions;
- to teach applicants for higher education to calculate the technological and organizational parameters of the construction of underground objects and manage these works

3. Learning outcomes:

On the basis of the received knowledge of applicants of higher education **should be able independently:**

- identify methods, select equipment and develop technology for construction of mine excavations (underground objects) in severe mining-geological and hydrogeological conditions;
- choose methods, technology and techniques to perform work at the stages of construction of mine excavations (underground objects) in severe conditions;
- determine the effect of external factors and take into account their influence when designing the technology constructions of mine excavations (underground objects);
- to make projects of works on construction of mine excavations (underground objects) in severe conditions;
- calculate the technological and organizational parameters of the construction of underground objects.

4. The structure of the discipline

LECTURE
1 General questions about the construction of underground objects in special ways
2 Construction of workings with the use of sheet piling
3 Construction of underground objects using the method of "diaphragm wall"
4 Construction of underground objects using drop-shaft method
5 Construction of underground objects using compressed air
6 Construction of underground objects using water reduction
7 Construction of underground objects using the method of freezing rocks
8 Control measures
PRACTICAL TRAINING
Design of technological parameters and organization of work in the mine excavations, carried out by freezing

5. Hardware and / or software

Lectures with the use of multimedia support; practical classes - calculation tasks.

6. Knowledge progress testing

Certification of student achievement is accomplished through transparent procedures based on objective criteria in accordance with the University Regulations “On Evaluation of Higher Education Applicants' Learning Outcomes”.

The level of competencies achieved in relation to the expectations, identified during the control activities, reflects the real result of the student's study of the discipline.

6.1 Grading scales

Assessment of academic achievement of students of the Dnipro University of Technology is carried out based on a rating (100-point) and institutional grading scales. The latter is necessary (in the official absence of a national scale) to convert (transfer) grades for mobile students.

The scales of assessment of learning outcomes of the NTUDP students

Rating	Institutional
90 ... 100	Excellent
74 ... 89	Good
60 ... 73	Satisfactory
0 ... 59	Failed

Discipline credits are scored if the student has a final grade of at least 60 points. A lower grade is considered to be an academic debt that is subject to liquidation in accordance with the Regulations on the Organization of the Educational Process of NTUDP.

6.2 Diagnostic tools and evaluation procedures

The content of diagnostic tools is aimed at controlling the level of knowledge, skills, communication, autonomy, and responsibility of the student according to the requirements of the National Qualifications Framework (NQF) up to the 7th qualification level during the demonstration of the learning outcomes regulated by the work program.

During the control activities, the student should perform tasks focused solely on the demonstration of disciplinary learning outcomes (Section 2).

Diagnostic tools provided to students at the control activities in the form of tasks for the intermediate and final knowledge progress testing are formed by specifying the initial data and a way of demonstrating disciplinary learning outcomes.

Diagnostic tools (control tasks) for the intermediate and final knowledge progress testing are approved by the appropriate department.

Type of diagnostic tools and procedures for evaluating the intermediate and final knowledge progress testing are given below.

Diagnostic and assessment procedures

<table>
<tr><td colspan="3">INTERMEDIATE CONTROL</td><td colspan="2">FINAL ASSESSMENT</td></tr>
<tr><td>training sessions</td><td>diagnostic tools</td><td>procedures</td><td>diagnostic tools</td><td>procedures</td></tr>
<tr><td>lectures</td><td>control tasks for each topic</td><td>task during lectures</td><td rowspan="3">comprehensive reference work (CCW)</td><td rowspan="3">determining the average results of intermediate controls;
CCW performance during the examination at the request of the student</td></tr>
<tr><td rowspan="2">practical</td><td>control tasks for each topic</td><td>tasks during practical classes</td></tr>
<tr><td>or individual task</td><td>tasks during independent work</td></tr>
</table>

During the intermediate control, the lectures are evaluated by determining the quality of the performance of the control specific tasks. Practical classes are assessed by the quality of the control or individual task.

If the content of a particular type of teaching activity is subordinated to several descriptors, then the integral value of the assessment may be determined by the weighting coefficients set by the lecturer.

Provided that the level of results of the intermediate controls of all types of training at least 60 points, the final control can be carried out without the student's immediate participation by determining the weighted average value of the obtained grades.

Regardless of the results of the intermediate control, every student during the final knowledge progress testing has the right to perform the CDF, which contains tasks covering key disciplinary learning outcomes.

The number of specific tasks of the CDF should be consistent with the allotted time for completion. The number of CDF options should ensure that the task is individualized.

The value of the mark for the implementation of the CDF is determined by the average evaluation of the components (specific tasks) and is final.

The integral value of the CDF performance assessment can be determined by taking into account the weighting factors established by the department for each NLC descriptor.

6.3 Evaluation criteria

The actual student learning outcomes are identified and measured against what is expected during the control activities using criteria that describe the student's actions to demonstrate the achievement of the learning outcomes.

To evaluate the performance of the control tasks during the intermediate control of lectures and practicals the assimilation factor is used as a criterion, which automatically adapts the indicator to the rating scale:

$$O_i = 100\ a / m,$$

where a – number of correct answers or significant operations performed according to the solution standard; m – the total number of questions or substantial operations of the standard.

Individual tasks and complex control works are expertly evaluated using criteria that characterize the ratio of competency requirements and evaluation indicators to a rating scale.

7. Course policy

7.1. Academic Integrity Policy.

Academic integrity of students is an important condition for mastering the results of training in the discipline and obtaining a satisfactory grade on the current and final tests. Academic integrity is based on condemnation of the practices of copying (writing with external sources other than those allowed for use), plagiarism (reproduction of published texts by other authors without indication of authorship), fabrication (fabrication of data or facts used in the educational process). The policy on academic integrity is regulated by the Regulation "Regulations on the system of prevention and detection of plagiarism at the Dnipro University of Technology (http://www.nmu.org.ua/ua/content/activity/us_documents / System_of_prevention_and_detection_of_plagiarism.pdf.)

In case of violation of academic integrity by a student (copying, plagiarism, fabrication), the work is evaluated unsatisfactorily and must be repeated. The teacher reserves the right to change the topic of the task.

7.2. Communication policy.

Students must have activated university mail.

It is the student's responsibility to check the mailbox at Office365 once a week (every Sunday).

During the weeks of independent work it is the student's responsibility to work with the distance course "Special building geotechnologies" (www.do.nmu.org.ua)

All written questions to teachers regarding the course should be sent to the university e-mail.

7.3. Reassembly policy.

Works that are submitted in violation of deadlines without good reason are evaluated at a lower grade. Relocation takes place with the permission of the dean's office if there are good reasons (for example, sick leave).

7.4. Attending classes.

Full-time students are required to attend classes. Good reasons for not attending classes are illness, participation in university events, business trips, which must be confirmed by documents in case of prolonged (two weeks) absence. The student must inform the teacher either in person or through the headmaster about the absence from class and the reasons for absence. If a student is ill, we recommend staying home and studying with a distance platform. Students whose health is unsatisfactory and may affect the health of other students will be encouraged to leave the class (such absence will be considered an absence due to illness). Practical classes are not repeated, these assessments cannot be obtained during the consultation. For objective reasons (for example, international mobility), learning can take place remotely – online, in agreement with the teacher.

7.5 Evaluation Appeal Policy.

If the student does not agree with the assessment of his knowledge, he may appeal the assessment made by the teacher in the prescribed manner.

7.6. Bonuses.

Students who regularly attended lectures (have no more than two passes without good reason) and have a written syllabus of lectures receive an additional 2 points to the results of the assessment to the final grade.

7.7. Participation in the survey.

At the end of the course and before the session, students will be asked to fill out anonymously questionnaires (Microsoft Forms Office 365), which will be sent to your university mailboxes. Completing the questionnaires is an important component of your learning activity, which will allow you to assess the effectiveness of the teaching methods used and take into account your suggestions for improving the content of the discipline "Special building geotechnologies".

8. Information resources

1. Правила технічної експлуатації вугільних шахт. СОУ 10.1-00185790-002-2005.– Київ: Мінвуглепром України, 2006. – 353 с. [Стандарт Мінвуглепрому України].
2. Правила безпеки у вугільних шахтах. НПАОП 10.0-1.01-10.– К.: ВВО «Основа», 2010.– 185 с. [Нормативний правовий акт про охорону праці] (https://zakon.rada.gov.ua/laws/show/z0398-10)
3. Складання списку літератури в навчальних виданнях: посіб. для наук.-пед. працівників / В.О. Салов, О.Н. Нефедова, О.Н. Ільченко, В.В. Панченко, Т.О. Недайвода, В.Г. Римар; М-во освіти і науки України, Нац. гірн. ун-т. – Д.: НГУ, 2013. – 39 с.
4. НПАОП 0.00-1.66-13. Правила безпеки під час поводження з вибуховими матеріалами промислового призначення. – ДП «Луганський ЕТЦ», 2013. – 193 с.
5. Технологія та безпека виконання вибухових робіт. Практикум / Соболєв В.В., Усик І.І., Терещук Р.М. – Д.: НГУ, 2006. 114 с.
6. ДСТУ Б А.2.4-4-99 (ГОСТ 21.101-97) Основные требования к проектной и рабочей документации. – К.: Укрархбудінформ, 1999. – 58 с.
7. Справочник инженера-шахтостроителя. В 2 т./ Под общ. ред. В.В. Белого. – М.: Недра, 1983.

8. Насонов И.Д., Ресин В.И., Шуплик М.Н., Федюкин В.А. Технология строительства подземных сооружений. Учебник для ВУЗов в трех частях. Ч. III. Специальные способы строительства. М.: Издательство Академии горных наук, 1998. - 375 с.
9. Справочник по сооружению шахтных стволов специальными способами / Под ред. Н.Г.Трупака. М.: Недра, 1980. – 391 с.
10. Справочник взрывника / Под ред. Б.Н. Кутузова. – М.: Недра, 1988. – 511 с.
11. Самєдов А.М., Кравець В.Г. Будівництво міських підземних споруд. Підручник, Київ. – 2008.
12. ПП “Будівельні технології – КОШТОРИС”. Computer Logic, ltd, 2000.
13. ДБН Д. 2.2-35-99 Ресурсні елементні кошторисні норми на будівельні роботи: Зб. Е35. – Харків. – 2000.