

Syllabus
selective component of VC

Engineering searches

Discipline name:	Engineering searches
Level of higher education:	First (undergraduate)
Course page in Moodle:	https://dl2022.khadi.kharkov.ua/course/view.php?id=1189
The volume of the educational component	4 credits (120 hours)
Form of final control	Test
Consultations:	on schedule
Name of the department:	Department of Road Design, Geodesy and Land Management
Language of instruction:	English
Course leader:	Fomenko Halyna Romanivna, Candidate of Technical Sciences, Associate Professor
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Brief content of the educational component:

The goal is training of specialists to independently solve professional problems related to engineering research in the process of designing and building square objects, roads and engineering structures.

Subject: planning and organization of engineering searches for new and reconstruction of existing square and linear objects.

The main tasks of studying an academic discipline are:

- conduct searches in areas with dangerous geological and engineering-geological processes;
- carry out searches for the preparation of territorial planning documents, taking into account their assessment and features.

Prerequisites for studying the educational component:

Higher mathematics; Informatics.

Competencies acquired by the acquirer:

General competences:

Ability to apply knowledge in practical situations.

Ability to use information and communication technologies.

Special (professional) competences:

The ability to choose and use effective methods, technologies and equipment for carrying out professional activities in the field of engineering investigations.

Learning outcomes:

Convey information, ideas, problems, solutions, own experience and arguments to specialists and non-specialists.

Know and apply technical means and methods of engineering geodetic research and surveys.

Thematic plan

Topic number	Title of topics (LK, LR, PR, SZ, SR)	Number of hours	
		Full-Time	Correspondence
1	LK - General concepts of engineering investigations. Technical and economic searches.	4	1
	PR – Preparation of the technical task for conducting engineering surveys.	2	1
	SR - Study of the materials of the topic 1. The order of coordination during the execution of engineering research works. Connection of economic and technical characteristics of highways.	9	13
2	LK – Economical variant design. Engineering and geodetic searches.	4	1
	PR – Setting the category of the road and the estimated speed of movement. Design of the track section and calculation of geometric parameters.	2	1
	SR – Study of topic materials 2. Preparation of initial data for the development of project solutions. Peculiarities of track tracing of linear structures.	9	13
3	LK – Technical means and methods of engineering and geodetic research. Engineering and geodetic searches for project development.	4	1
	PR – Construction of the longitudinal profile of the road when tracing on the map.	2	1
	SR – Study of the materials of topic 3. Engineering and geodetic searches for the development of pre-project documentation. Engineering and geodetic searches for the development of the reconstruction project.	9	13
4	LK – Engineering and geological prospecting. Technical means and methods of conducting soil and geological surveys.	4	1
	PR – Construction of the soil and geological profile of the road section.	2	1
	SR – Study of the materials of topic 4. Basic and secondary quarries, reserves assessment. Peculiarities of hydrological research.	9	13
5	LK – Engineering-geological searches in areas with dangerous geological and engineering-geological processes. Engineering and hydrometeorological searches.	4	1
	PR – Construction of the soil and geological profile of the road section.	2	–
	SR - Study of materials of topic 5. Engineering and geological searches in the areas of development of processing processes of sea shores, reservoirs, lakes and rivers. Which belongs to the flow characteristics.	9	14
6	LK – Technical means and methods of conducting engineering and hydrometeorological investigations. Engineering hydrometeorological surveys for the preparation of territorial planning documents.	4	1
	PR – Protection of territories from engineering and geological processes.	2	–
	SR – Study of materials of topic 6. Conducting investigative hydrometeorological works. Engineering and hydrometeorological searches for the development of working documentation for construction.	9	14

7	LK – Engineering and environmental investigations. Engineering and environmental searches for the preparation of documents on the evaluation of the territory.	4	1
	PR – Hydraulic calculation of culvert parameters.	2	–
	SR – Study of materials of topic 7. Engineering and ecological searches	9	14
8	LK – Methods of researching the pollution of territories and atmospheric air. Engineering and hydrological studies.	4	1
	PR – Hydraulic calculation of culvert parameters.	2	–
	SR - Study of the materials of topic 8. Features of the system of ecological monitoring of the environment. Peculiarities of studies of pollution of environmental territories.	9	14
ALL by discipline		120	120

Teaching methods:

verbal (lectures, explanations, stories, conversations, discussions, work with books, etc.);
visual (illustration and demonstration method);
practical tasks.

Grading system and requirements:

Current success

1 The current success of applicants for the performance of educational types of work in training sessions and for the performance of tasks of independent work is assessed using a four-point scale of grades, followed by recalculation into a 100-point scale. During the assessment of current performance, all types of work provided for by the curriculum are taken into account.

1.1 Lectures are evaluated by determining the quality of the specified tasks.

1.2 Practical classes are assessed by the quality of the control or individual task, the performance and design of practical work.

1.3 Laboratory classes are assessed by the quality of the implementation of reports on the performance of laboratory work.

1.4 Seminars are evaluated by the quality of the individual task / abstract.

2 Evaluation of the current performance of applicants for higher education is carried out at each practical lesson (laboratory or seminar) on a four-point scale ("5", "4", "C", "2") and recorded in the journal of accounting for academic performance.

– "excellent": the applicant perfectly mastered the theoretical material, demonstrates deep knowledge of the relevant topic or academic discipline, the main provisions;

– "good": the applicant has well mastered the theoretical material, owns the main aspects from primary sources and recommended literature, reasonably teaches it; has practical skills, expresses his reasoning about certain problems, but assumes certain inaccuracies and errors in the logic of presenting theoretical content or in the analysis of practical;

– "satisfactory": the applicant has mainly mastered the theoretical knowledge of an academic topic or discipline, is oriented in primary sources and recommended literature, but unconvincingly answers, confuses concepts, uncertainly answers additional questions, does not have stable knowledge; answering questions of a practical nature, reveals inaccuracies in knowledge, does not know how to evaluate facts and phenomena, connect them with a future profession;

– "unsatisfactory": the applicant has not mastered the educational material of the topic (discipline), does not know scientific facts, definitions, is almost not oriented in

primary sources and recommended literature, there is no scientific thinking, practical skills are not formed.

3 The final score for current activities is recognized as the arithmetic average sum of points for each lesson, for individual work, current tests according to the formula:

$$K^{nomoy} = \frac{K1 + K2 + \dots + Kn}{n},$$

where K^{nomoy} – is the final assessment of success based on the results of current control;

$K1, K2, \dots, Kn$ – assessment of the success of the measure of current control;

n – the number of measures of current control.

Scores are converted to points according to the recalculation scale (Table 1).

Table 1 – Recalculation of the average score for current activities into a multi-point scale

4-point Scale	100-point Scale	4-point Scale	100-point Scale	4-point Scale	100-point Scale	4-point Scale	100-point Scale
<u>5</u>	<u>100</u>	<u>4,45</u>	<u>89</u>	<u>3,90</u>	<u>78</u>	<u>3,35</u>	<u>67</u>
<u>4,95</u>	<u>99</u>	<u>4,4</u>	<u>88</u>	<u>3,85</u>	<u>77</u>	<u>3,3</u>	<u>66</u>
<u>4,9</u>	<u>98</u>	<u>4,35</u>	<u>87</u>	<u>3,80</u>	<u>76</u>	<u>3,25</u>	<u>65</u>
<u>4,85</u>	<u>97</u>	<u>4,3</u>	<u>86</u>	<u>3,75</u>	<u>75</u>	<u>3,2</u>	<u>64</u>
<u>4,8</u>	<u>96</u>	<u>4,25</u>	<u>85</u>	<u>3,7</u>	<u>74</u>	<u>3,15</u>	<u>63</u>
<u>4,75</u>	<u>95</u>	<u>4,20</u>	<u>84</u>	<u>3,65</u>	<u>73</u>	<u>3,1</u>	<u>62</u>
<u>4,7</u>	<u>94</u>	<u>4,15</u>	<u>83</u>	<u>3,60</u>	<u>72</u>	<u>3,05</u>	<u>61</u>
<u>4,65</u>	<u>93</u>	<u>4,10</u>	<u>82</u>	<u>3,55</u>	<u>71</u>	<u>3</u>	<u>60</u>
<u>4,6</u>	<u>92</u>	<u>4,05</u>	<u>81</u>	<u>3,5</u>	<u>70</u>	from 1,78 to 2,99	from 35 to 59
						Reassembly	
<u>4,55</u>	<u>91</u>	<u>4,00</u>	<u>80</u>	<u>3,45</u>	<u>69</u>	from 0 to 1,77	from 0 to 34
<u>4,5</u>	<u>90</u>	<u>3,95</u>	<u>79</u>	<u>3,4</u>	<u>68</u>	Re-study	

Final assessment

1 The applicant for higher education receives credit at the last lesson in the discipline based on the results of the current assessment. The average score for current activities is converted into points on a 100-point scale, according to the recalculation table (Table 1).

Applicants for higher education who have an average current grade in a discipline lower than "3" (60 points) in the last lesson can increase their current score by passing tests in the discipline.

Assessment of knowledge of applicants by testing is carried out on a scale:

- "Excellent": at least 90% of correct answers;
- "Very good": from 82% to 89% of correct answers;
- "Good": from 74% to 81% of correct answers;
- "Satisfactory": from 67% to 73% of correct answers;
- "Satisfactory enough": from 60% to 66% of correct answers;
- "Unsatisfactory": less than 60% of correct answers.

2 The condition for obtaining the test is:

- working out all missed classes;
- the average current score in the discipline is not lower than "3" (60 points).

3 For the implementation of individual independent work and participation in scientific events, applicants are awarded additional points.

3.1 Additional points are added to the sum of points scored by the higher education student for current academic activities (for disciplines for which the test is the final form of control), or to the final grade in the discipline for which the exam is the final form of control.

3.2 The number of additional points awarded for different types of individual tasks depends on their volume and significance:

- prizes in the discipline at the international / all-Ukrainian competition of scientific student works – 20 points;
- prizes in the discipline at the All-Ukrainian Olympiads – 20 points;
- participation in the international / all-Ukrainian competition of scientific student works – 15 points
- participation in international / all-Ukrainian scientific conferences of students and young scientists – 12 points;
- participation in all-Ukrainian olympiads in the discipline – 10 points
- participation in olympiads and scientific conferences of KhNADU in the discipline – 5 points;
- implementation of individual research (educational and research) tasks of increased complexity – 5 points.

3.3 The number of additional points may not exceed 20 points.

4 The result of training is evaluated (*choose the right one*):

- on a two-point scale (credited/not credited) according to table 2;
- on a 100-point scale (for differentiated standings) according to Table 3.

The final score, together with additional points, cannot exceed 100 points.

Table 2 – Scale of transfer of points to the national grading system

On a 100-point scale	On a national scale
from 60 points to 100 points	enrolled
less than 60 points	unaccounted for

Table 3 – Scale of assessment of applicants' knowledge based on the results of the final control in the discipline

Score in points	National scale score		ECTS score	
	Exam	Passed	Score	Criteria
90-100	Perfectly	Enrolled	A	The theoretical content of the course is mastered entirely, without gaps, the necessary practical skills of working with the mastered material are formed, all the training tasks provided by the training program have been completed, the quality of their implementation is estimated by the number of points close to the maximum

80–89	Well	Enrolled	B	The theoretical content of the course is mastered entirely, without gaps, the necessary practical skills in working with the mastered material are mainly formed, all the training tasks provided by the training program have been completed, the quality of most of them is estimated by the number of points close to the maximum
75-79			C	The theoretical content of the course is mastered entirely, without gaps, some practical skills of working with the mastered material are not sufficiently formed, all the training tasks provided by the training program have been completed, the quality of none of them is assessed by the minimum number of points, some types of tasks are performed with errors
67-74	Satisfactory		D	The theoretical content of the course is partially mastered, but the gaps are not significant, the necessary practical skills in working with the mastered material are mainly formed, most of the training tasks provided by the training program have been completed, some of the tasks performed may contain errors
60–66			E	The theoretical content of the course is partially mastered, some practical skills of work are not formed, many of the training tasks provided by the training program have not been completed, or the quality of some of them is estimated by the number of points close to the minimum.
35–59	Disappointing	Not credited	FX	The theoretical content of the course is partially mastered, the necessary practical skills of work are not formed, most of the provided training programs have not been completed, or the quality of their implementation is estimated by the number of points close to the minimum; with additional independent work on the course material, it is possible to improve the quality of the training tasks (with the possibility of re-compilation)
0–34	Unacceptable		F	The theoretical content of the course has not been mastered, the necessary practical skills of work are not formed, all completed training tasks contain gross errors, additional independent work on the course material will not lead to any significant improvement in the quality of the training tasks (with a mandatory repeated course)

Course Policy:

- the course involves teamwork, the environment in the audience is friendly, creative, open to constructive criticism;
- mastering the discipline involves the obligatory attendance of lectures and practical classes, as well as independent work;
- independent work involves the study of individual topics of the discipline, which are made in accordance with the program for independent study, or were considered briefly;
- all tasks envisaged by the program must be completed within the prescribed period;
- if the applicant for higher education is absent from the classroom for a good reason, he presents the completed tasks during the independent preparation and consultation of the teacher;
- while studying the course, applicants for higher education must comply with the rules of academic integrity set forth in the following documents: "Rules of academic integrity of participants in the educational process of KhNADU" (https://www.khadi.kharkov.ua/fileadmin/P_Standart/pologeniya/stvnz_67_01_dobroch_1.pdf), "Academic integrity. Verification of the text of academic, scientific and qualification works for plagiarism" (https://www.khadi.kharkov.ua/fileadmin/P_Standart/pologeniya/stvnz_85_1_01.pdf), "Moral and ethical code of participants in the educational process of KhNADU" (https://www.khadi.kharkov.ua/fileadmin/P_Standart/pologeniya/stvnz_67_01_MEK_1.pdf).
- in case of detection of the fact of plagiarism, the applicant receives 0 points for the task and must re-complete the tasks provided for in the syllabus;
- write-offs during tests and exams are prohibited (including using mobile devices). Mobile devices are only allowed to be used during online testing.

Recommended Books:

1. Ostrovsky A.L. Geodesy / A.L. Ostrovsky, O.I. Moroz, V.L. Tarnavskiy. Lviv: View of Lviv. polytechnics, 2012. 564 p.
2. Ostrovsky A.L. Geodesy. Part one. Topography / A.L. Ostrovsky, O.I. Moroz, Z.R. Tartachynska, I.F. Gerasimchuk. Lviv: View of Lviv. polytechnics, 2011. 440 p.
3. Khomyak A.Ya. Engineering searches in transport construction. Study guide. K.: "Znannia", 2007. 348 p.
4. Fomenko G.R. Methodical instructions for practical classes in the discipline "Engineering investigations" / G.R. Fomenko, O.V. Kruhmalova. Kharkiv: Khnadu, 2018. 52 p.

Additional sources:

1. distance course:
<https://dl2022.khadi.kharkov.ua/course/view.php?id=1189>
2. <http://files.khadi.kharkov.ua>
3. <http://www.nbvv.gov.ua>
4. <http://korolenko.kharkov.com>
5. <http://library.univer.kharkov.ua>

Developer (developers)
syllabus of the discipline

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