

Syllabus
selective component of VC

Workshop on engineering geodesy

Discipline name:	Workshop on engineering geodesy
Level of higher education:	First (undergraduate)
Course page in Moodle:	https://dl2022.khadi.kharkov.ua/course/view.php?id=1194
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:	Tymoshevskiy Vladyslav Viktorovich, Doctor of Economics, Associate Professor
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Brief content of the educational component:

The goal is practical training of students, as future specialists, to independently perform checks and adjustments of geodetic equipment and measuring works with geodetic tools.

Subject: study of modern methods and methods of carrying out geodetic surveys and carrying out a complex of geodetic support works for the transfer of projects to nature.

The main tasks of studying an academic discipline are:

providing the future specialist with engineering knowledge for the selection of methods, methods and technical means in order to apply the latest technologies during the execution of design and research works and the necessary technical justification of land management decisions in the process of execution of chamber works, drawing up land cadastral and project plans, calculating areas and drawing up explanations lands, design of objects, transfer of projects to the area.

Prerequisites for studying the educational component:

Geodesy; Higher mathematics; Engineering geodesy.

Competencies acquired by the acquirer:

General competences:

- Ability to learn and master modern knowledge.
- Ability to apply knowledge in practical situations.
- Ability to use information and communication technologies.
- Ability to perform safe activities

Special (professional) competences:

Ability to apply theories, principles, methods of physical and mathematical, natural, socio-economic, and engineering sciences when performing tasks of geodesy and land management.

Ability to apply regulatory and legal acts, regulatory and technical documents, reference materials in professional activities.

The ability to use modern information, technical and technological support to solve complex issues of geodesy and land management.

Learning outcomes:

Participate in the creation of state geodetic networks and special engineering geodetic networks, organize and perform topographic and cadastral surveys, geodetic measurements, engineering geodetic searches for the design, construction and operation of construction objects.

Select and apply the tools, equipment, equipment and software required for remote, terrestrial, field and camera surveys in the field of geodesy and land management.

Organize and perform remote, ground, field and camera work in the field of geodesy and land management, prepare the results of the work, prepare relevant reports.

Thematic plan

Topic number	Title of topics (LK, LR, PR, SZ, SR)	Number of hours	
		Full-Time	Correspondence
1	2	3	4
1	LC 1	–	–
	LR 1 Surveying the terrain with the use of EGP. Processing of field geodetic measurements using the Geodesy module	4	2
	SR 1 Study of topic material 1. Applied programs of EGP Alignment of theodolite, tacheometric and leveling moves	4	8
2	LC 2	–	–
	LR 2 Binding of a raster image to the results of field geodetic measurements using the Models module. Construction of the terrain situation by means of the Digitals software complex (collection of contours)	4	–
	CP 2 Studying the material of topic 2. Vectorization of raster images Calculation of contour areas	4	8
3	LC 3	–	–
	LR 3 Creation of exchange files using the Digitals software complex Editing of the service part of the exchange file	4	2
	CP3 Studying the material of topic 3. The structure of the exchange file. The structure of the service part of the exchange file	4	8
4	LC 4	–	–
	LR 4 Editing of the metric part of the exchange file Recalculation of the coordinates of the points of the district boundary of the land plot (CK42, CK63, USK2000)	4	–
	CP 4 Study of topic material 4. The structure of the metric part of the coordinate system exchange file	4	8
5	LC 5	–	–
	LR 5 Working with exchange files using XML Viewer Editing an exchange file using XML Viewer	4	2
	SR 5 Studying the material of the topic 5. Viewing the exchange file Making corrections to the exchange file	4	8
6	LC 6	–	–
	LR 6 Working with raster images Orientation of a raster image	4	–
	SR 6 Study of topic material 6. Binding and vectorization of raster images Software tools for orientation of rasters	4	8
7	LC 7	–	–
	LR 7 Installation of a raster substrate Work with raster-vector maps	4	–
	SR 7 Study of topic material 7. Scaling of raster images Making changes to raster-vector maps	4	8
8	LC 8	–	–
	LR 8 Transformation of rasters Web-map services	4	–

	SR 8 Study of topic material 8. Selection of transformation points Work with a public cadastral map	4	8
9	LC 9	–	–
	LR 9 Checks and adjustments of electronic total stations	4	–
	SR 9 Filling out the inspection log	4	6
10	LC 10	–	–
	LR 10 Checks and adjustments of electronic total stations	4	–
	SR 10 Filling out the inspection log	4	6
11	LC 11	–	–
	LR 11 Checks and adjustments of electronic total stations	4	–
	SR 11 Filling out the inspection log	4	6
12	LC 12	–	–
	LR 12 Checks and adjustments of high-precision levels	4	–
	SR 12 Filling out the inspection log	4	6
13	LC 13	–	–
	LR 13 Checks and adjustments of high-precision levels	2	–
	SR 13 Filling out the inspection log	4	6
14	LC 14	–	–
	LR 14 Checking and adjusting optical levels	2	–
	SR 14 Filling out the inspection log	4	6
15	LC 15	–	–
	LR 15 Checks and adjustments of optical theodolites	2	–
	SR 15 Filling out the inspection log	4	6
16	LC 16	–	–
	LR 16 Checks and adjustments of optical theodolites	2	2
	SR 16 Filling out the inspection log	4	6
7 semesters in total		120	120
ALL by discipline		120	120

Teaching methods:

verbal (explanation, story, conversation, discussion, work with a book), laboratory tasks and independent work of the applicant.

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:

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

where K^{nomoch} – 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	
			Score	Criteria
Exam	Passed			
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. Zuska A.V. Engineering geodesy: education. manual / A.V. Zuska Dnipro: NSU, 2016. 209 p.
3. Batrakova A.G., Dorozhko E.V., Zakharova E.V., Klyuka O.M. Analysis and generalization of regulatory support for geodetic support of road construction objects.

Communal management of cities: Scientific and technical collection. [Series: Technical sciences]. Kharkiv: KhNUMG, 2021. Volume 4. Issue.. 164. P. 99-103.

4. Ratushniak H.S. Geodetic support of construction. Part 1: study guide / H.S. Ratushnyak, O.D. Pankevich, Yu.S. Biks, T.Yu. Wolf. Vinnytsia: VNTU, 2014. 98 p.

5. Dorozhko E.V. Methodical instructions for laboratory works in the discipline "Practicalum in engineering geodesy" for students of specialty 193 "Geodesy and land management" / E.V. Dorozhko, V.M. Fedorenko. Kharkiv: Khnadu, 2017. 35 p.

Additional sources:

1. distance course:

<https://dl2022.khadi.kharkov.ua/course/view.php?id=1194>

2. <http://files.khadi.kharkov.ua>

3. <http://www.nbvv.gov.ua>

4. <http://korolenko.kharkov.com>

5. <http://library.univer.kharkov.ua>

6. <http://map.land.gov.ua/kadastrova-karta>

7. <http://zakon4.rada.gov.ua>

Developer (developers)
syllabus of the discipline

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