Silabussive component

Fundamentals of Automotive and Road Engineering Certification

Discipline name:	**Fundamentals of Automotive and Road Engineering Certification**
Level of higher education:	**First (bachelor'scue)**
Course page in Moodle:	***https://dl2022.khadi-kh.com/course/view.php?id=895***
The volume of the educational component	**4 credits (120 hours)**
Form of final control	**Passed**
Consultations:	**on schedule**
Name of the department:	**Department of Metrology and Life Safety**
Language of instruction:	**English**
Course leader:	**Olga Maletska, Ph.D.**
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Summary of the educational component:

The goal is to train specialists in conformity assessment of automotive and road equipment.

Subject*:* Requirements for conformity assessment of automotive and road equipment. Study of the requirements of the technical regulations for the safety of machines and the requirements for technical inspection, testing and expert examination (technical diagnostics) of automotive and road equipment.

The main tasks of studying the discipline are:

– formation of a conceptual apparatus for assessing the conformity of products, in particular automotive and road equipment, on the basis of knowledge of the legislative requirements of technical regulation, the acquisition of knowledge on technical expertise;
– acquisition of the necessary skills of applying the acquired knowledge to solve practical problems in the field of conformity assessment of automotive and road equipment

Prerequisites for studying the educational component:

Competences that the applicant acquires:

***General competencies*:**

Ability to search, process and analyze information from various sources.

Ability to abstract thinking, analysis and synthesis.

Ability to identify, set and solve problems in the field of conformity assessment.

Ability to adapt and act in a new situation regarding **technical inspection, testing and expert examination (technical diagnostics)** of automotive and road equipment.

Special (professional) competencies:

Ability to use during conformity assessment of automotive and road equipment:
- requirements of the legislation on conformity assessment;
- methods for determining the compliance of automotive and road equipment with the established requirements;

- knowledge of the types and methods of conformity assessment and technical **inspection, testing and expert examination (technical diagnostics) of** automotive and road equipment;
- methods of selection of measures for putting into circulation and / or operation of automotive and road equipment.

Ability to use the principles, methods and organizational procedures of conformity assessment.

Ability to apply and integrate knowledge and understanding of disciplines of related engineering fields.

Learning outcomes:

Possess modern methods of scientific knowledge at the level of the latest achievements in the field of technical regulation necessary for research and / or innovation, carry out information search and analyze its results.

Own the methods of conformity assessment, processing and analysis of results, design of results.

Demonstrate and implement in professional activities knowledge of the system of technical regulation

Thematic plan

№ Theme	Title of topics (LK, LR, PR, SZ, WED)	Number of hours	
		Eye	Correspondence
1	LUKE. European and national system of technical regulation. History of the development of the European system of technical regulation. Formation of a national system of technical regulation. Harmonization of the national system of technical regulation with the European one.	2	
	PR 1. Determination of the basic principles of technical regulation in Ukraine.	2	
	WED. The study of the material of the topic LC 1. Preparation for the implementation of PR 1. Study of the Law of Ukraine "On Technical Regulations and Conformity Assessment". Registration of the report on PR 1.	11	
2	LUKE. International and national standardization. History of standardization. Types of standardization. Regulatory documents. Application of national regulations. Information base.	2	
	PR 2. Types of regulatory documents, their search and application.	2	
	WED. The study of the material of the topic LC 2. Preparation for the implementation of PR 2. Study of the Law of Ukraine "On Standardization". Registration of the report on PR 2.	11	
3	LUKE. Organization and conduct of conformity assessment. Technical inspection, testing and expert examination (technical diagnostics) of automotive and road equipment.	2	

	PR 3. Determination of requirements for technical inspection, testing and expert examination (technical diagnostics) of automotive and road equipment.	2	
	WED. Study of the material of the topic LC 3. Preparation for the implementation of PR 3. Registration of the report on PR 3.	11	
4	LUKE. Conformity assessment of technical regulations. Conformity assessment modules. Technical regulations. Ensuring compliance of products with technical regulations. Application of conformity assessment procedures. Requirements for the implementation of modules.	2	
	PR 4. Determination of requirements for the selection and implementation of conformity assessment modules.	2	
	WED. The study of the material of the topic LC 4. Preparation for the implementation of PR 4. Registration of the report on PR 4.	11	
5	LUKE. Technical regulations for the safety of machines and its application in the enterprise. Basic requirements of the Technical Regulations for the safety of machines. Applied terms. Application of the Technical Regulations for the safety of cars to automotive and road equipment. .	2	
	PR 5. Establishing the requirements of the technical regulations for the safety of cars for automotive and road equipment.	2	
	WED. The study of the material of the topic LC 5. Preparation for the implementation of PR 5. Study of the general part of the Technical Regulations for the safety of machines. Registration of the report on PR 5.	11	
6	LUKE. Conformity assessment procedures for machines. Consideration of the processes of implementation of conformity assessment of machines. Rules for the application of procedures. Internal control of machine production.	2	
	PR 6. Organization of internal control of the production of machines	2	
	WED. The study of the material of the topic LC 6. Preparation for the implementation of PR 6. Study of conformity assessment procedures for machines according to the Technical Regulations for the Safety of Machines. Registration of the report on PR 6.	11	
7	LUKE. Procedures that can be used to assess the conformity of machines.	2	
	PR 7. Implementation of the type verification procedure and full quality assurance.	2	
	WED. The study of the material of the topic LC 7. Preparation for the implementation of PR 7. Study of the relevant requirements according to the Technical Regulations for the safety of machines. Registration of the report on PR 7.	11	
8	LK. Requirements of the Technical Regulations for the Safety of Machines to the designated conformity assessment bodies.	2	

	PR 8. Drawing up a technical file for the machine.	2	
	WED. The study of the material of the topic LC 8. Preparation for the implementation of PR 8. Study of the requirements of the Technical Regulations for the Safety of Machines to prevent specific hazards. Registration of a report on PR 8.	11	
Together	LUX	16	
	AVE	16	
	WED	88	

Teaching methods:
verbal (lectures, explanations, narration, conversation, discussion, work with a book, etc.) visual (method of illustration and demonstration), 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 in a 100-point scale. When assessing 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 performance of specific 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 are 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 mastered the theoretical material well, 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 the educational topic, or discipline, is guided 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:

$$K^{\text{помоч}} = \frac{K1 + K2 + ... + Kn}{n},$$

where $K^{\text{помоч}}$ is the final assessment of success based on the results of current control;

$K1, K2, ..., Kn$ – assessment of the success of the -th measure of current control; n

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

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			**With**	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			**And**	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.

Score in points	National scale score		ECTS score	
	Exam	Passed	Score	Criteria
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;

– course work must be protected no later than a week before the start of the examination session ***(indicated if available)*;**

– 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 literature:

1. R. M. Trisch Metrology and Standardization: Textbook. posib. for stud. Higher. educational institutions / D. A. Yanushkevich, M. V. Moskalenko, O. E. Maletska. Ukr.inzh.- ped.acad. - H.: 2014.- 444 p.
2. Ivanov V.M. Technical diagnostics of lifting and transport machines. Tutorial. – H.: "FORT" publishing house, 2010. – 276 p.
3. Fundamentals of technical regulation of construction and road machines: a textbook / I. G. Kirichenko, R. M. Trisch, D. A. Yanushkevich and others. – Kh.: KhNADU, 2014. – 512 p.
4. Law of Ukraine of 05.06.2014 No 1315-VII "On Standardization".
5. Law of Ukraine of 15.01.2015 No 124-VIII "On Technical Regulations and Conformity Assessment".
6. Resolution of the Cabinet of Ministers of Ukraine dated 30.01.2013 No 62 "On approval of the Technical Regulations for the safety of machines" as amended.
7. Resolution of the Cabinet of Ministers of Ukraine dated 26.05.2004 No 687 "On approval of the Procedure for inspection, testing and expert examination (technical diagnostics) of machines, mechanisms, equipment of increased danger" as amended.
8. Resolution of the Cabinet of Ministers of Ukraine of December 30, 2015 No. 1184 "On approval of the form, description of the mark of conformity to technical regulations, rules and conditions for its application"

Additional Sources:

1. Distance course: https://dl2022.khadi-kh.com/course/view.php?id=895

The developer
of the syllabus of the discipline _____Olga MALETSKA
signature

Head of the Department _____ Oleg BOGATOV
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