

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
KHARKIV NATIONAL AUTOMOBILE AND HIGHWAY UNIVERSITY

EDUCATIONAL AND PROFESSIONAL PROGRAM

professional/scientific

"Lifting and transport, construction, road, reclamation
machines and equipment"

the name of the OP

Second (master's) level of higher education

the name of the level of education

by specialty 133 "Industrial engineering"

code and specialty name

fields of knowledge 13 Mechanical engineering

code and name of the field of knowledge

Qualification Master of Industrial Engineering

the name of the qualification

APPROVED by
SCIENTIFIC COUNCIL OF KhNAHU
protocol No.

Head of the academic council

_____ Viktor BOHOMOLOV

signature

Name and surname

The educational program will be implemented
from 2023.

Order No.

Rector

_____ Victor BOHOMOLOV

signature

Name and surname

Kharkiv 2023

PREFACE

1. Developed by the project group:

Volodymyr SUPONYEV,

Ph.D., professor, professor of the CRM
department

OP's
guarantor.

Natalia FIDROVSKA,

Ph.D., professor, head of CRM
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signature

Vitaly RAGULIN,

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Viktor TATARYNSKY,

Ph.D., associate professor, associate
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Dmytro HMYRYA,

student M -51-22

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2. Recommended by the methodological commission of the

Mechanical Faculty

Protocol No _____ from « _____ » _____ 2023

3. Approved by the Methodical Council

Protocol No _____ from « _____ » _____ 2023

4. Reviewers:

1. **Artem Dmytrovych Zaichenko**, technical director of LLC "Scientific and Production Enterprise "Gaztehnika LTD";
2. **Roman Anatoliiovych Berezhnoi**, chief designer of "SVITLO SHAKHTARIA".

1. PROFILE OF EDUCATIONAL PROGRAM

1 - General information	
Full name of the institution of higher education and the department responsible for the implementation of	Kharkiv National Automobile and Highway University, Faculty of Mechanics, Department of construction and road machines
Higher degree education and the name of the qualification in the original language	Master's degree from industrial engineering
The official name of the educational program	Educational and professional program "Lifting and transport, construction, road, reclamation machines and equipment"
Type of diploma and scope of the educational program	Master's degree, single, 90 ECTS credits, term study 1 year 5 months
Availability of accreditation	Accreditation is active Ukrainian. Certificate issuance date 11/25/2022 No. 3631.
Cycle/level	HPK of Ukraine – 7th level, FQ-EHEA – second cycle, EQF-LLL – 7th level
Prerequisites	A bachelor's degree
Language(s) of instruction	English
The term of validity of the educational	5 years
Internet address of the permanent placement of the description of the educational program	https://www.khadi.kharkov.ua/education/katalog-osvitnikh-program/133-galuzeve-mashinobuduvannja/ and https://mf.khadi.kharkov.ua/departments/budivelnikh-i-dorozhnikh-mashin/magistratura/
2 - The purpose of the educational program	
Provision of training in specialty 133 "Industrial engineering" and support of masters in their solution of complex problems in the field of mechanical engineering, which involves a deep rethinking of the existing and creation of new holistic knowledge and professional practice.	

3 – Characteristics of the educational program

Subject area (field of knowledge, specialty)	13 Mechanical engineering 133 Industrial engineering
Orientation of the educational program	The educational and professional program offers a comprehensive approach to solving modern problems in lifting and transport, construction, road and reclamation engineering at the local, regional and national levels. The disciplines and sections of the program are based on theoretical knowledge that is closely related to practical skills. The program allows students to acquire the necessary skills in mechanical engineering.
The main focus of the educational program and specialization	General program: "Lifting and transport, construction, road, reclamation machines and equipment". Emphasis is placed on the acquisition of skills and knowledge in mechanical engineering, which involves the ability to ensure reliable operation and high-quality management of lifting and transport, construction, road and reclamation machines, defined employment and the possibility of further education and career growth. The scientific and practical significance of solving the problems inherent in this specialty lies in the creation and improvement of modern means of design, technological and information support, which guarantee high qualitative and quantitative indicators of processes in organizational and technical objects and complexes and, as a result, increasing quality, reliability, optimization, competitiveness of the latter in various branches of the economy.
Features of the program	The program provides a differentiated approach to master's students with the integration of professional and pedagogical training, which gives the right to teach in higher educational institutions. The results of scientific research aimed at solving an applied scientific and technical problem in the field of mechanical engineering, or scientific and methodological development in order to improve the quality of the educational process.

4 – Suitability of graduates for employment and further education

<p>Suitability for employment</p>	<p>The specialist is trained to work in the following branches of mechanical engineering at production enterprises, organizations and institutions of various ministries of Ukraine, which have structural divisions for design, research, production and maintenance of machines and have the right to hold positions in accordance with the National Classifier of Ukraine DK 003:2010.</p> <p>1210.1 Heads of enterprises, institutions and organizations</p> <p>1222.1 The major specialists – managers and technical heads of production units in industry</p> <p>1222.2 Chiefs (other managers) and foremen of production units (subdivisions) in industry</p> <p>1229.1 Managerial employees of the apparatus of central state authorities</p> <p>1229.4 Heads of units in the field of education and industrial training</p> <p>1229.7 Heads of other main divisions in other spheres of activity</p> <p>1235 Heads of material and technical supply units</p> <p>Chief specialists – heads of research units and units for scientific and technical training of production and other managers</p> <p>Heads of research units and units for scientific and technical production training and other managers</p> <p>1238 Project and program managers</p> <p>1312 Managers of small enterprises without a management apparatus in industry</p> <p>Research staff (engineering mechanics)</p> <p>Mechanical engineers</p> <p>Research staff (other branches of engineering)</p> <p>Engineers (other fields of engineering)</p> <p>2310.2 Other teachers of universities and higher educational institutions</p> <p>2320 Teachers of secondary educational institutions</p> <p>2419.2 Professionals in the field of marketing, business efficiency, rationalization of production, intellectual property and innovation</p>
<p>Further education</p>	<p>The master's degree in specialty 133 "Industrial engineering" can continue studying in the program of the third level of higher education for obtaining the scientific degree of PhD.</p>

5 – Teaching and assessment	
Teaching and learning	Teaching is conducted in the form of lectures, practical classes, laboratory work, seminars, individual classes, work in small groups, practice, consultations with teachers, independent work of students.
Assessment	Assessment is conducted in the form of written exams, practice reports, tests, course projects or course papers. Final certification – preparation and defense of a master's thesis.
6 – Software competencies	
Integral competence	Ability to solve complex problems of industrial engineering, involving research and/or implementation of innovations and characterized by uncertainty of conditions and requirements
General competences (GC)	GC1. Ability to use information and communication technologies GC2. Ability to learn and master modern knowledge GC3. Ability to search, process and analyze information from various sources GC4. Ability to be critical and self-critical GC5. Ability to adapt and act in a new situation GC6. Ability to generate new ideas (creativity) GC7. Ability to identify, put and solve problems GC8. Ability to make informed decisions GC9. Ability to working the team
Special (professional, subject) competences of the specialty (SC)	SC1. Ability to create, improve and apply quantitative mathematical, scientific and technical methods and computer software tools, to apply a systematic approach to solving engineering problems of industrial engineering, in particular, in conditions of technical uncertainty. SC2. Critical understanding of advanced scientific facts, concepts, theories, principles for industrial mechanical engineering and the ability to apply them to solve complex problems of industrial mechanical engineering and ensuring sustainable development. SC3. Ability to create new techniques and technologies in the field of mechanical engineering. SC4. Realizing promising tasks of modern production, aimed at satisfying the needs of consumers, mastering the trends of innovative development of industry technologies. SC5. Ability to develop and implement plans and projects in the field of mechanical engineering and related activities, carry out relevant business activities. SC6. Ability to use knowledge in solving problems of improving the quality of lifting and transport, construction, road, reclamation machinery and equipment and its control.

7 – Program learning outcomes

PLO1. Knowledge and understanding of the basics of technological, fundamental and engineering sciences, which are the basis of industrial engineering in the relevant field

PLO2. Knowledge and understanding of mechanics and mechanical engineering and prospects for their development.

PLO3. Knowledge and understanding of the processes of industrial engineering, having skills in their practical use.

PLO4. Carrying out engineering calculations to solve complex problems and practical problems in industrial mechanical engineering.

PLO5. Analyzing engineering objects, processes and methods.

PLO6. Searching for the necessary scientific and technical information in available sources, in particular, in a foreign language, analyzing and evaluating it.

PLO7. Preparing the production and operating the products of industrial engineering during their life cycle

PLO8. Having skills in solving tasks to improve the quality of lifting and transport, construction, road, reclamation machines and equipment

8 – Resource support for program implementation

Staff support	100% of scientific and pedagogical workers involved in teaching professionally oriented disciplines in the specialty 133 "Industrial engineering" have scientific degrees and academic titles.
Material and technical support	Provision of educational facilities and laboratories meets the need. The department has a training ground where the main types of construction, road and transport machines in working condition are presented.
Informational and educational and methodological support	The following is provided: Educational and methodical literature (manuals, monographs, lecture notes, methodical instructions and recommendations, textbooks, etc.) which is located in the library and in digital archive I'm looking for (https://dspace.khadi.kharkov.ua/dspace/?locale=uk). Distance course-resources, which are created on the basis of virtual educational Moodle environment, posted on the Educational website of the Khnadu (https://dl2022.khadi-kh.com).

9 – Academic mobility

National credit mobility	Individual academic mobility is implemented within the framework of inter-university agreements on the establishment of scientific and educational relations to meet the needs of the development of education and science.
International credit mobility	On the basis of bilateral contracts between the Kharkiv National Automobile and Highway University and higher educational institutions of foreign partner countries.
Education of foreign students	It is possible to train foreign applicants for higher education

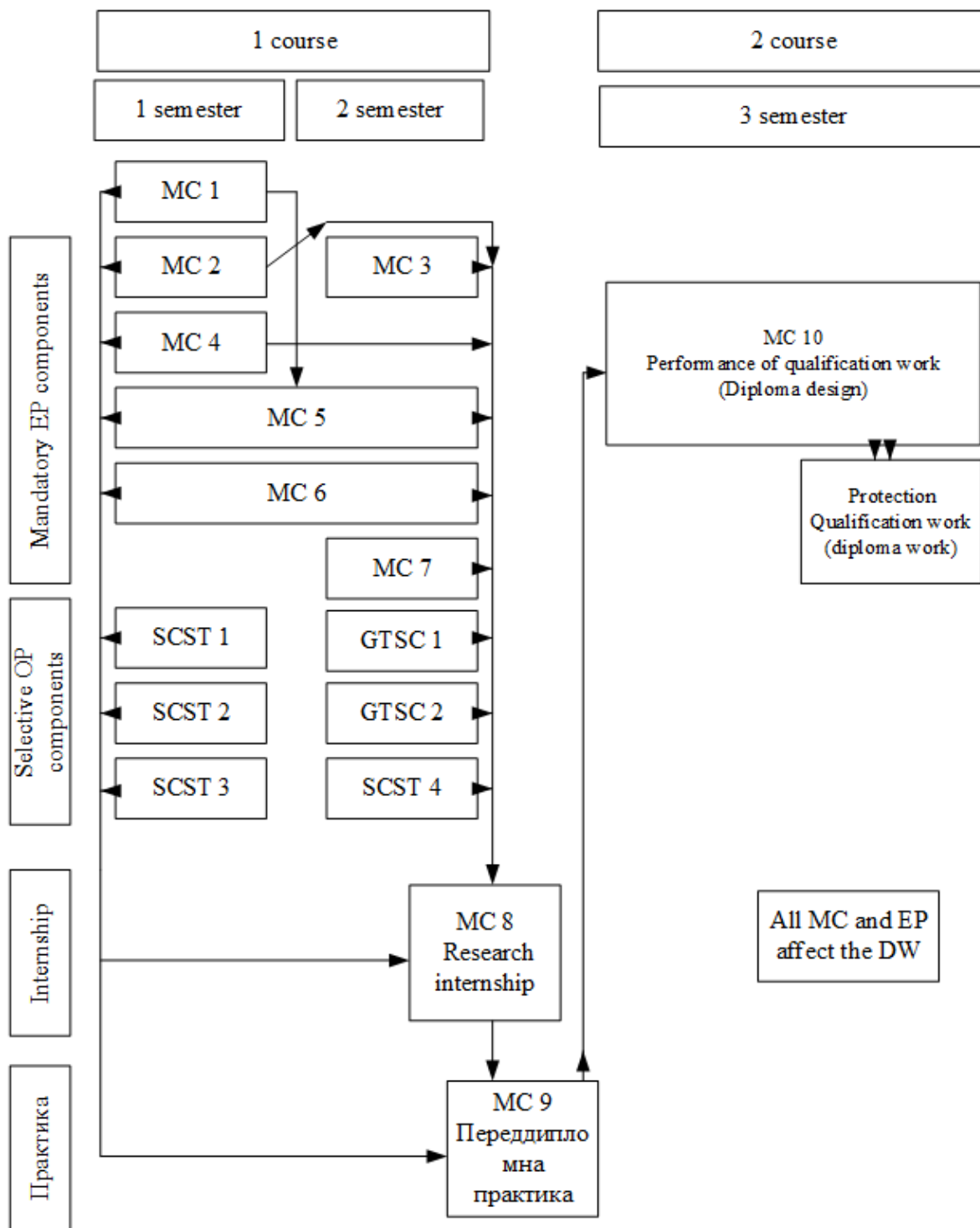
2. LIST OF THE COMPONENTS OF THE EDUCATIONAL PROGRAM AND THEIR LOGICAL SEQUENCE

2.1 List of EP components

Code	Components of the educational program (study subjects, course projects (papers), practices, qualification work)	Number of credits	Form of final control
1	2	3	4
1.Mandatory EP components (MC)			
1.1 Cycle of disciplines of general training			
MC1	Foreign Language	3	test
MC2	Technology of scientific research	3	exam
MC3	Civil Protection	3	test
1.2 Cycle of professional training disciplines			
MC4	Dynamics of construction and road machines	5	exam
MC5	Design and testing of hydraulic drives	6	exam
MC6	Modeling of work processes of construction and road machines	8	credit (1)/ exam (2)
MC7	Scientific research work	5	credit (1)/ credit (2)
MC8	Research internship	3	test
MC9	Pre-diploma practice	6	test
MC10	Qualification work	24	protection
The total volume of mandatory components:		66	
2. Selective OP components (SCGT)			
2.1 Cycle of disciplines of general training (SCGT)			
GTSC.1	Elective discipline1	4	test
GTSC.2	Elective discipline2	4	test
2.2 Cycle of professional training disciplines (SCST)			
SCST.1	Elective discipline1	4	test
SCST.2	Elective discipline2	4	test
SCST.3	Elective discipline3	4	test
SCST.4	Elective discipline4	4	test
Total volume of sample components		24	
GENERAL SCOPE OF THE EDUCATIONAL PROGRAM		90	

2.2 The university-wide catalog of optional disciplines is posted on the official website the university website via the link <https://www.khadi.kharkov.ua/education/katalog-vibirkovikh-disciplin/>. The acquirer can choose either in the discipline from the general university catalog.

3. STRUCTURAL AND LOGICAL SCHEME OP



4. ASSESSMENT OF HIGHER EDUCATION ACQUIRES

Forms of attestation of higher education applicants:

— public defense (demonstration) of qualification work.

Requirements for qualification work:

Qualification work involves the solution of a complex design and scientific problem in the field of mechanical engineering, which involves conducting research and implementing innovations.

Qualification work should not contain academic plagiarism, fabrication, or falsification.

Qualification work must be published on the official website in the repository of the institution of higher education.

5. MATRIXI CORRESPONDENCE OF SOFTWARE COMPETENCES TO THE COMPONENTS OF THE EDUCATIONAL PROGRAM

	MC1	MC2	MC3	MC4	MC5	MC6	MC7	MC8	MC9	MC10
GC1		+			+	+			+	+
GC2	+				+		+		+	
GC3	+					+	+	+	+	+
GC4				+			+			+
GC5	+		+					+	+	+
GC6		+			+	+				+
GC7		+	+	+	+	+				
GC8			+	+	+		+			+
GC9	+		+					+	+	
SK1				+	+	+	+			+
SK2	+	+		+	+	+	+	+		+
SK3			+			+	+		+	+
SK4	+	+			+	+			+	
SK5	+		+					+	+	+
SK6		+		+	+		+			+

6. MATRIX ENSURING PROGRAM LEARNING OUTCOMES BY COMPONENTS OF THE EDUCATIONAL PROGRAM

	MC1	MC2	MC3	MC4	MC5	MC6	MC7	MC8	MC9	MC10
PLO1		+				+	+			+
PLO2	+			+	+			+	+	+
PLO3	+		+		+	+		+	+	+
PLO4				+	+	+	+			+
PLO5	+	+	+	+	+	+			+	+
PLO6	+	+			+	+	+	+	+	+
PLO7			+				+		+	
PLO8		+		+	+		+			+

7. MATRIXI CORRESPONDENCE OF CURRICULUM LEARNING OUTCOMES (LEARNING OUTCOMES) AND COMPETENCES

Learning outcomes	Competences														
	Integral competence														
	General competences									Special (professional) competences					
	GC1	GC2	GC3	GC4	GC5	GC6	GC7	GC8	GC9	SK1	SK2	SK3	SK4	SK5	SK6
PLO1			+			+		+			+	+	+	+	
PLO2						+		+		+		+		+	+
PLO3		+	+	+			+		+			+	+	+	+
PLO4	+		+		+	+		+	+						
PLO5		+	+	+					+	+	+	+	+	+	
PLO6						+	+	+						+	+
PLO7		+		+			+						+	+	+
PLO8		+	+	+			+					+	+	+	