MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

KYIV NATIONAL UNIVERSITY
TECHNOLOGY AND DESIGN

APPROVED BY THE SCIENTIFIC COUNCIL
Chairman of the Academic Council of KNUTD

_____ I.M. Grishchenko

(Minutes of 17.12. 2020 №5)

EDUCATIONAL AND PROFESSIONAL PROGRAM

ENGINEERING

Level of higher education	first (bachelor's)
Degree of higher education	bachelor
Field of knowledge	13 Mechanical engineering
Specialty	133 Industrial Engineering
Qualification	Bachelor of Industrial Engineering

Kyiv 2020

LETTER OF APPROVAL

Educational and professional program
ENGINEERING

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Degree of higher education bachelor

Field of knowledge 13 Mechanical engineering

Specialty 133 Industrial Engineering

Vice-rector for scientific and pedagogical activities (educational activities)

_____ _____ OB Morgulets
(date) (signature)

Approved by the Academic Council of the Facultymechatronics and computer technology

Minutes of the ____ _____ 2020 № _____

V. o. dean of the facultymechatronics and computer technology

_____ _____ NV Chuprinka
(date) (signature)

Discussed and recommended at the meeting of the departmentapplied mechanics and machines

Protocol from "____" _____ 2020 № ____

Head of Departmentapplied mechanics and machines

_____ _____ OP Manoilenko
(date) (signature)

Guarantor of the educational program

_____ _____ VM Dvorzhak
(date) (signature)

Put into effect by the order of KNUTD from "___" _____ 2020 № ___.

PREFACE

DEVELOPED: Kyiv National University of Technology and Design

DEVELOPERS:

Guarantor of the educational program Dvorzhak Volodymyr Mykolayovych, Candidate of Technical Sciences, Associate Professor, Associate Professor of the Department of Applied Mechanics and MachinesKyiv National University of Technology and Design

Members of the working group:
Moon Volodymyr Petrovych, Doctor of Technical Sciences, Professor, Professor of the Department of Applied Mechanics and MachinesKyiv National University of Technology and Design;

Berezin Leonid Mykolayovych, Candidate of Technical Sciences, Associate Professor, Associate Professor of the Department of Applied Mechanics and MachinesKyiv National University of Technology and Design;

Romanenko Myroslav Kostiantynovych, student of the Faculty of Mechatronics and Computer TechnologiesKyiv National University of Technology and Design.

REVIEWS OF EXTERNAL STAKEHOLDERS:

1) Selivonchyk IS - Director of MTK LGC;
2) Korchak VP - Director of PJSC "TEXTEMP";
3) Ivanova LI - Director of DANA-FASHION LGC;
4) Trunov DA - Director of Technopolis.

1.Profile of the educational and professional program of Mechanical Engineering

1 - General information	
Full name of the institution of higher education and structural unit	Kyiv National University of Technology and Design Department of Applied Mechanics and Machines.
Degree of higher education and qualification in the original language	The level of higher education is the first (bachelor's). Degree of higher education - bachelor. Field of knowledge - 13 Mechanical Engineering. Specialty - 133 Industrial Engineering.
Type of diploma and scope of educational program	Bachelor's degree, single, 240/180 ECTS credits.
Availability of accreditation	Certificate of accreditation of the educational program dated July 11, 2018. UD № 11002997.
Cycle / level	The National Qualifications Framework of Ukraine is the seventh level.
Prerequisites	Complete general secondary education, professional higher education or a bachelor's degree.
Language (s) of instruction	Ukrainian
Term of the educational program	Until July 1, 2023
Internet address of the permanent post of the description of the educational program	https://knutd.edu.ua/ekts/2021/op-fmkt
2 - The purpose of the educational program	
Training of specialists with deep knowledge, as well as basic and professional competencies in the field of light industry engineering, aimed at acquiring the student knowledge, skills and abilities necessary to ensure his ability to perform design, technological and managerial functions related to processes of design, production and operation of facilities and systems of light industry engineering. **The main goals**programs are the training of specialists who are able to substantiate, develop new and improve existing technical facilities of mechanical engineering; develop new and improve existing technological processes of production and disposal of mechanical engineering products; apply modern design methods based on modeling of technical facilities and processes of light engineering industry.	
3 - Characteristics of the educational program	
Subject area	The program is focused on the formation of applicants' competencies for the acquisition of deep knowledge, skills and abilities in the field of mechanical engineering and light industry equipment. Compulsory educational components - 75%, of which: disciplines of general training - 30%, vocational training - 44%, practical training - 13%, learning a foreign language - 13%. Disciplines of free choice of students - 25%, of which expanding: general competencies - 30%, professional - 70%.
Orientation of the educational program	Educational and professional program.
The main focus of the educational program	General program:general education in the field of mechanical engineering. Emphasis is placed on technical, mathematical, informational, software and organizational support of systems aimed at the development, research and implementation in the production of design documentation, structures of mechanisms, machines, devices, equipment of light

	industry.	
Features of the educational program	The program focuses on professional training in light industry and consumer services. The program develops theoretical and practical training in the design, manufacture and operation of technical systems, machinery and equipment, and complexes, development of technologies of machine-building industries.	
4 - Suitability of graduates for employment and further study		
Suitability for employment	The graduate is suitable for employment in enterprises, organizations and institutions in the field of design, manufacture, operation, storage and repair of machines for various industries, including light industry. The bachelor in branch mechanical engineering is prepared to perform professional work in the following positions: mechanic, production mechanic, equipment repair mechanic, reloading machine mechanic, shop mechanic, adjusting mechanic, production process automation technician, equipment operation and repair technician, tool technician, technician for mechanization of labor-intensive processes, technician-designer (mechanics), technician-technologist (mechanics), copyist of technical documentation, draftsman, draftsman-designer, instructor on operational, production-technical and organizational issues, laboratory assistant (technical field), debugging technician and tests, production preparation technicians, technical documentation preparation technicians.	
Further training	Opportunity to study according to the educational-scientific and / or educational-professional program of the second (master's) level of higher education.	
5 - Teaching and assessment		
Teaching and learning	Student-centered and problem-oriented learning, learning through educational, industrial and undergraduate practice and self-study are used. The system of teaching methods is based on the principles of purposefulness, binary - active direct participation of research and teaching staff and students of higher education. Forms of organization of the educational process: lecture, seminar, practical, laboratory classes, practical training, independent work, consultation, development of professional projects.	
Evaluation	Knowledge testing, oral presentations, reports on laboratory work, reports on practice, tests, course projects, tests, exams.	
6 - Program competencies		
Integral competence (IR)	The ability of a person to solve complex specialized problems and practical problems in a particular field of professional activity or in the learning process, which involves the use of certain theories and methods of relevant sciences and is characterized by complexity and uncertainty of conditions.	
General competencies (GC)	GC 1	Ability to think abstractly.
	GC 2	Ability to apply knowledge in practical situations.
	GC 3	Ability to plan and manage time.
	GC 4	Ability to search, process and analyze information from various sources.
	GC 5	Ability to generate new ideas (creativity).
	GC 6	Ability to conduct research at a certain level.
	GC 7	Ability to communicate in a foreign language.
	GC 8	Ability to act socially responsibly and consciously.
	GC 9	Ability to motivate people and move towards a common goal.
	GC 10	Skills in the use of information and communication

		technologies.
	GC 11	Ability to work in a team.
	GC 12	Ability to exercise their rights and responsibilities as a member of society, to realize the values of public (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine.
	GC 13	Ability to preserve and increase moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, techniques and technologies. active recreation and healthy living.
Professional competencies (FC)	FC 1	Ability to use standard analytical methods and computer software to solve engineering problems of industrial engineering, effective quantitative methods of mathematics, physics, engineering, as well as appropriate computer software to solve engineering problems of industrial engineering.
	FC 2	Ability to apply fundamental scientific facts, concepts, theories, principles to solve professional problems and practical problems of industrial engineering.
	FC 3	Ability to evaluate and ensure the quality of work performed.
	FC 4	Ability to implement engineering developments in the field of mechanical engineering, taking into account technical, organizational, legal, economic and environmental aspects throughout the life cycle of the machine: from design, construction, operation, maintenance, diagnostics and disposal.
	FC 5	Ability to use computer-aided design systems and specialized application software to solve engineering problems in the field of mechanical engineering.
	FC 6	Ability to evaluate the technical and economic efficiency of standard systems and their components based on the use of analytical methods, analysis of analogues and the use of available data.
	FC 7	Ability to make effective decisions about the manufacture of structural materials, equipment, processes and combine theory and practice to solve engineering problems.
	FC 8	Ability to realize creative and innovative potential in project developments in the field of mechanical engineering.
	FC 9	Ability to carry out commercial and economic activities in the field of industrial engineering.
	FC 10	Ability to develop plans and projects in the field of industrial engineering under uncertain conditions, aimed at achieving the goal, taking into account the existing constraints, to solve complex problems and practical problems of improving product quality and control.
	FC 11	Ability to master and use modern equipment of light industry, including elements of mechatronics.
	FC 12	Ability to use methods of caGCulation of modern machine-building systems.
	FC 13	Ability to model casting and heat transfer processes in light industry.

7 - Program learning outcomes (PLO)	
Knowledge and understanding:	
PLO 1	Knowledge and understanding of the principles of technological, fundamental and engineering sciences that underlie the branch engineering of the relevant industry.
PLO 2	Knowledge and understanding of mechanics and mechanical engineering and prospects of their development.
PLO 3	To know and understand systems of automatic control of objects and processes of branch mechanical engineering, to have skills of their practical use.
Application of knowledge and understanding (skills):	
PLO 4	Carry out engineering caGCulations to solve complex problems and practical problems in the field of mechanical engineering.
PLO 5	Analyze engineering objects, processes and methods.
PLO 6	Prepare production and operate products using automatic life cycle support systems.
PLO 7	Understand the relevant methods and have the skills to design standard components and mechanisms in accordance with the task.
PLO 8	Select and apply the necessary equipment, tools and methods.
PLO 9	Understand the problems of labor protection and legal aspects of engineering in the field of mechanical engineering, skills of forecasting the social and environmental consequences of technical tasks.
PLO 10	Apply technical control tools to assess the parameters of objects and processes in the field of mechanical engineering.
PLO 11	Understand the structures and services of industry engineering enterprises.
PLO 12	Develop parts and assemblies of machines using computer-aided design systems.
PLO 13	Be able to use different types and forms of physical activity for active recreation and healthy living.
PLO 14	Understand the structure, principle of operation and features of operation of machinery and equipment of various light industries.
Formation of judgments:	
PLO 15	Search for the necessary scientific and technical information in available sources, in particular, in a foreign language, analyze and evaluate it.
PLO 16	Free to communicate with the engineering community orally and in writing in state and foreign languages.

8 - Resource support for program implementation	
Staffing	All scientific and pedagogical workers who provide the educational program on qualification, correspond to a profile and a direction of the educational components which are taught; have the necessary experience of pedagogical work and experience of practical work. In the process of organizing training, professionals with experience in research / management / innovation / creative work and / or work in the specialty are involved.
Logistics	Logistics allows to fully ensure the educational process throughout the training cycle of the educational program. The condition of the premises is certified by sanitary and technical passports that comply with current regulations.
Information and educational and methodological support	The program is fully provided with an educational and methodological complex of all components of the educational program, the availability of which is presented in the modular environment of the educational process KNUTD.

9 - Academic mobility	
National credit mobility	Provides for the possibility of academic mobility for somecomponents of the educational program, providing the acquisition of general or professional competencies.
International credit	The program develops prospects for participation and internships in

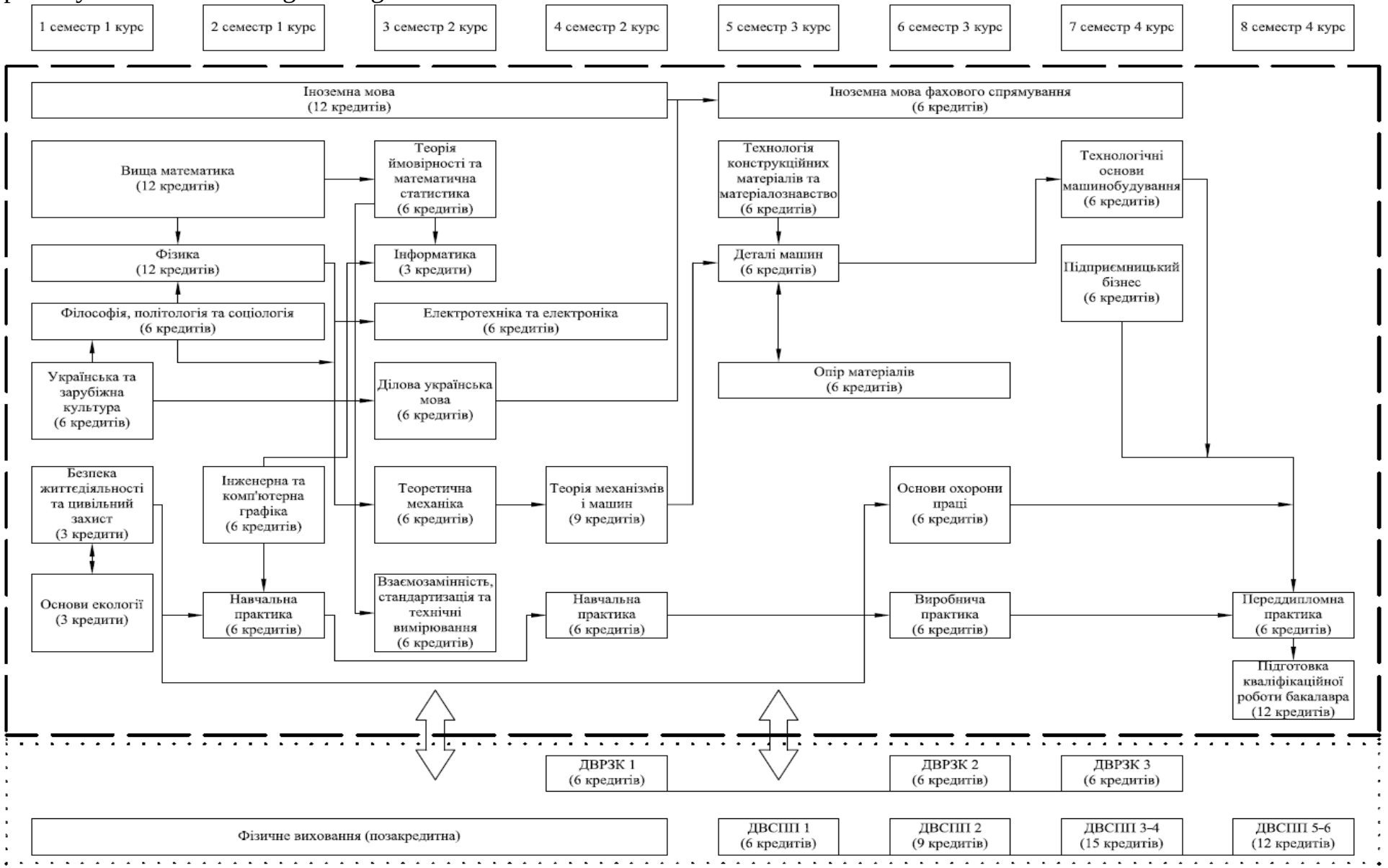
mobility	research projects and academic mobility programs abroad.
Training of foreign applicants for higher education	Training of foreign applicants for higher education is carried out according to accredited educational programs.

2. The list of components of the educational-professional program of Mechanical Engineering and their logical sequence

2.1 List of components of the educational-professional program of the first (bachelor's) level of higher education

Code	Components of the educational program (academic disciplines, term papers (projects), practices, qualification work)	Number of loans	Form of final control
1	2	3	4
Mandatory components of the educational program			
General training cycle			
OK 1	Business Ukrainian	6	test
OK 2	Foreign Language	12	test, exam
OK 3	Ukrainian and foreign culture	6	test
OK 4	Philosophy, political science and sociology	6	exam
OK 5	Physical education1	-	test
OK 6	Higher mathematics	12	test, exam
OK 7	Probability theory and mathematical statistics	6	exam
OK 8	Physics	12	test, exam
OK 9	Engineering and computer graphics	6	exam
OK 10	Computer Science	3	exam
OK 11	Electrical engineering and electronics	6	exam
OK 12	Entrepreneurial business	3	test
OK 13	Life safety and civil protection	3	exam
OK 14	Basics of labor protection	6	exam
OK 15	Principles of Ecology	3	test
Total from the cycle		90	
Cycle of professional training			
OK 16	Theoretical mechanics	6	exam
OK 17	Theory of mechanisms and machines	9	exam
OK 18	Strength of Materials	6	test,exam
OK 19	Details of machines	6	exam
OK 20	Foreign language of professional orientation	9	test,exam
OK 21	Interchangeability, standardization and technical measurements	6	exam
OK 22	Technology of construction materials and materials science	6	exam
OK 23	Technological bases of mechanical engineering	6	exam
OK 24	Practical training	18	test
OK 25	Pre-diPLOma practice	6	test
OK 26	Bachelor's thesis (project)	12	certification
Total from the cycle		90	
The total amount of required components		**180**	
Selective components of the educational program			
DFCS	Disciplines of free choice of the student	60	test
The total amount of sample components		**60**	
TOTAL VOLUME OF THE EDUCATIONAL PROGRAM		**240**	

2.2 Structural and logical scheme of bachelor's degreeeducational and professional program of Mechanical Engineering in specialty 133 Industrial Engineering



3. Form of certification of applicants for higher education

Forms of certification of applicants for higher education	Certification of higher education seekers is carried out in the form of public defense of a bachelor's thesis (project).
Document of higher education	Bachelor's degree with educational qualification: Bachelor's degree in mechanical engineering

4. Matrix of correspondence of program competencies to the components of the educational-professional program of Mechanical Engineering

	GC1	GC2	GC3	GC4	GC5	GC6	GC7	GC8	GC9	3K10	3K11	3K12	3K13	FC1	FC2	FC3	FC4	FC5	FC6	FC7	FC8	FC9	FC10	FC11	FC12	FC13
OK1				+					+	+	+										+	+				
OK2	+	+					+			+	+										+	+				
OK3							+					+	+													
OK4	+				+				+			+	+		+		+					+				
OK5			+						+		+		+			+										
OK6	+	+		+										+	+											
OK7		+		+										+		+		+								
OK8		+				+								+	+											
OK9	+	+												+				+								
OK10				+			+			+								+	+				+			
OK11		+													+											
OK12			+		+		+			+	+						+		+		+	+				
OK13								+				+				+							+			
OK14								+				+				+	+									
OK15												+	+			+	+									
OK16		+				+								+	+											
OK17		+				+								+												
OK18		+				+								+												
OK19		+				+								+						+						
OK20		+					+			+												+				
OK21		+		+																+						
OK22		+																		+						
OK23		+				+												+		+	+		+	+	+	+
OK24			+															+								
OK25			+	+	+			+								+		+	+							
OK26			+		+		+						+			+	+	+	+	+	+					

5. Matrix for providing software learning outcomes with relevant components of the educational and professional program of Mechanical Engineering

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12	PLO 13	PLO 14	PLO 15	PLO 16
OK1	+														+	+
OK2	+														+	+
OK3		+													+	+
OK4		+			+				+							
OK5		+							+				+		+	
OK6	+			+								+			+	
OK7	+				+		+									
OK8	+				+			+								
OK9		+			+		+					+				
OK10			+							+		+			+	
OK11	+		+		+			+		+						

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12	PLO 13	PLO 14	PLO 15	PLO 16
OK12		+				+			+		+					
OK13	+					+			+		+					
OK14	+					+			+							
OK15	+					+			+							
OK16	+	+		+			+									
OK17	+	+		+			+									
OK18	+				+		+									
OK19		+		+			+					+				
OK20	+														+	+
OK21	+		+		+			+		+						
OK22	+			+												
OK23		+	+			+		+				+		+	+	
OK24			+		+							+				
OK25	+				+			+							+	+
OK26		+		+			+					+				