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MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
National Aerospace University
«Kharkiv Aviation Institute»

APPROVED
Scientific council
National Aerospace University
«Kharkiv Aviation Institute»
22.12.2021, minute № 5

EDUCATIONAL AND PROFESSIONAL PROGRAMME

Rocket-Space Engineering

Degree of higher education – first (bachelor)
field of knowledge 13 Mechanical Engineering
speciality 134 Aerospace Engineering

Qualification: Bachelor in Aerospace Engineering of Areas
of knowledge Mechanical Engineering

Educational program is put into effect
from «01» September 2023

Rector of the National
Aerospace University
«Kharkiv Aviation Institute»

_____Mykola NECHYPORUK
Order № 446 of 28.12.2021

Kharkiv 2023

PREFACE

The educational and professional programme «Rocket-Space Engineering» for the training of applicants of the first (bachelor) level of higher education in the specialty 134 «Aerospace Engineering» at the National Aerospace University «Kharkiv Aviation Institute» has been updated due to the redistribution of ECTS credits between the components of the educational and professional programme and the update of the content of its description (approved by the decision of the Academic Council of the KhAI protocol № ____ of _____);

The educational and professional programme "Rocket-Space Engineering" was updated/modernised by the KhAI educational programme support group:

- | | | | |
|---|---|--|---|
| 1 | Guarantor (head) of the educational programme | M.A. Shevtsova

(signature) | – Candidate of Technical Sciences, Professor, Professor of the Department of Composite Structures and Aviation Materials Science |
| 2 | Group members: | H.M. Koloskova

(signature) | – Candidate of Technical Sciences, Associate Professor, Head of the Department of Design of Rocket Technology |
| 3 | | Y.O. Shepetov

(signature) | – Candidate of Technical Sciences, Associate Professor, Head of the Department of Space Technology and Non-Traditional Energy Sources |

Reviews and feedback from external stakeholders (if any):

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INTRODUCTION

According to Art. 1 «Basic Terms and Their Definitions» of the Law of Ukraine «On Higher Education» dated 01.07.2014 № 1556-VII (as amended) educational programme – a system of educational components at the appropriate level of higher education within the speciality, that defines the requirements for the level of education of persons who can start studying under this programme, the list of disciplines and the logical sequence of their study, the number of ECTS credits required to complete this programme, as well as the expected learning outcomes (competencies) that the applicant for the relevant degree must master.

The educational programme is used during:

- accreditation of the educational programme, inspection of educational activities in the speciality and specialisation;
- development of curriculum, programmes of educational disciplines and practices;
- development of diagnostics of higher education quality;
- determination of training content in the retraining and advanced training system;
- of professional orientation of applicants.

The educational and professional programme takes into account the requirements of the Law of Ukraine «On Higher Education» dated 01.07.2014 № 1556-VII (as amended), Resolution of the Cabinet of Ministers of Ukraine «On Approval of the National Qualifications Framework» dated 23.11.2011 № 1341 (as amended), the Standard of Higher Education in the speciality 134 «Aerospace Engineering» or the first (bachelor's) level of higher education Order of the Ministry of Education and Science № 1441 dated 22.12.2018) and establishes:

- general competencies;
- professional competencies;
- programme learning outcomes;
- list and scope of academic disciplines for mastering the competencies of the educational and professional programme;
- requirements for the structure of academic disciplines.
- The educational and professional programme is used for:
 - preparation of curricula and working curricula;
 - formation of individual plans of applicants;
 - formation of work programmes for academic disciplines and practices;
 - defining the information base for the development of diagnostic means;
 - accreditation of the educational and professional programme;
 - internal and external quality control of specialist training;
 - certification of bachelors in the educational and professional programme «Rocket-Space Engineering» in the speciality 134 «Aerospace Engineering».

Users of the educational programme:

- higher education applicants studying at the National Aerospace University «Kharkiv Aviation Institute»;
- scientific and pedagogical workers who train bachelors in the educational and professional programme «Rocket-Space Engineering» in the speciality 134 «Aerospace Engineering»;
- examination commission of specialty 134 «Aerospace Engineering»;
- Admissions Committee of the National Aerospace University «Kharkiv Aviation Institute».

The KhAI departments involved in the training of bachelor's degree specialists in the educational and professional programme «Rocket-Space Engineering» in the speciality 134 «Aerospace Engineering» are guided by this programme for the preparation of EMCD, curricula, etc.

1 REGULATORY REFERENCES

The educational and professional programme is developed on the basis of the following regulatory documents and recommendations:

1.1 Law of Ukraine «On Higher Education». № 1556-YII of 01.07.2014 (as amended).

1.2 Resolution of the Cabinet of Ministers of Ukraine «On Approval of the National Qualifications Framework» dated 23.11.2011 № 1341 (as amended).

1.3 Standard of higher education in the speciality 134 «Aerospace Engineering» for the first (bachelor's) level of higher education (Order of the Ministry of Education and Science No. 1441 of 22.12.2018).

1.4 Resolution of the Cabinet of Ministers of Ukraine «On Approval of the List of Fields of Knowledge and Specialities for Training of Higher Education Applicants» of 29.04.2015 № 266.

1.5 Resolution of the Cabinet of Ministers of Ukraine «On Approval of the Regulation on the Procedure for the Implementation of the Right to Academic Mobility» of 12.08.2015 № 579.

1.6 Methodological recommendations for the development of higher education standards (Order of the Ministry of Education and Science of Ukraine № 600 of 01.06.2017) approved by the higher education sector of the Scientific and Methodological Council of the Ministry of Education and Science of Ukraine (as amended).

1.7 Regulations «On the Organisation of the Educational Process» of the National Aerospace University «Kharkiv Aviation Institute».

1.8 A Tuning Guide to Formulating Degree Programme Profiles Including Programme Competences and Programme Learning Outcomes. -Bilbao, Groningen and The Hague, 2010.

1.9 A TUNING-AHELO conceptual framework of expected/desired learning outcomes in engineering. OECD Education Working Papers, No. 60, OECD Publishing 2011. <http://dx.doi.org/10.1787/5kghtchn8mbn-en>.

1.10 Development of educational programmes. Methodological recommendations / Authors: V.M. Zakharchenko, V.I. Lugovyi, Yu. Rashkevych, Zh.V. Talanova / Edited by V.G. Kremen. - K.: SE "NVC" Priorities, "2014. - 120 p.

1.11 Order of the Ministry of Education and Science of Ukraine «On the peculiarities of implementing the list of fields of knowledge and specialities in which higher education students are trained, approved by the Cabinet of Ministers of Ukraine of 29 April 2015 № 266» of 06.11.2015 № 1151.

1.12 Classification of economic activities: ДК 009:2010. – Effective from 01.01.2012 - (National Classifier of Ukraine).

1.13 Classifier of professions: ДК 003:2010. – Effective from 01.11.2010 - (National Classifier of Ukraine).

1.14 National Educational Glossary: Higher Education/2nd Ed., Revised Idop ./Aut.-uklad.: V.M. Zakharchenko, S.A. Kalashnikova, V.I. Lugovyi, A.V. Stavitsky, Yu.M. Rashkevich, Zh.V. Talanova/Edit V.G. Kremenya. - K.: LLC «Publishing House «Pleiady», 2014. – 100 p.

2 PROFILE OF EDUCATIONAL AND PROFESSIONAL PROGRAMME
«Rocket-Space Engineering»
in the speciality 134 «Aerospace Engineering»

1 – General information	
Full name of the higher education institution and structural unit	National Aerospace University «Kharkiv Aviation Institute» Faculty of Rocket and Space Engineering Department of Design of Rocket Technology Department of Space Technology and Non-Traditional Energy Sources Department of Composite Structures and Aviation Materials Science
Degree of higher education and title of qualification in the original language	Degree – Bachelor Qualification: Bachelor in Aerospace Engineering of Areas of knowledge Mechanical Engineering
Official name of the educational and professional programme	«Rocket-Space Engineering»
Type of diploma and scope of educational and professional programme	Bachelor's degree, unit, term of study 3 years 10 months – on the basis of complete general secondary education - 240 ECTS credits. – on the basis of the degree «professional junior bachelor», «junior bachelor» (educational qualification level «junior specialist») – 240 ECTS credits. At the same time, KhAI recognises and re-credits no more than 60 ECTS credits received within the previous educational programme of training for a professional junior bachelor, junior bachelor (junior specialist).
Availability of accreditation	Certificate of accreditation: Series УД № 21001693 dated 20 February 2018, issued on the basis of the order of the Ministry of Education and Science of Ukraine № 2642П dated 15.07.2014 (on the basis of the order of the Ministry of Education and Science of Ukraine № 1565 dated 19.12.2016 (minutes of the AK № 10 dated 08.07.2014). Accreditation period: until July 01, 2024. Updating or modernisation of the educational programme is carried out in accordance with Section 5 of the Regulation «On the Development and Modernisation of Educational Programmes at KhAI».
Cycle/level	First (bachelor's) level NQF of Ukraine - level 6, FQ-EHEA - first cycle, QF-LLL - level 6
Prerequisites	A person has the right to obtain a bachelor's degree, provided that there is a complete general secondary education in accordance with the procedure established by law
Teaching Language(s)	The language of teaching is state language and English. In order to create conditions for international academic mobility, a decision may be made to teach one or more disciplines in English and/or other foreign languages
Internet address for permanent posting of the description of the educational and professional programme	https://khai.edu.ua/education/osvitni-programi-i-komponenti/osvitni-programi-bakalavriv/
2 – Objective of the educational programme	

Training of highly qualified specialists (bachelors) capable of using professional knowledge and practical skills to solve complex specialised problems arising in the labour market and practical problems of employers in aerospace engineering, including with the help of composite materials.

3 – Characteristics of the educational and professional programme

Subject area	<p>Objects of study - phenomena and problems associated with the stages of creation of rocket-space engineering structures, including those made of composite materials.</p> <p>Learning objective – acquiring competencies sufficient to solve specialised and practical problems related to the development and manufacture of rocket-space engineering structures, including those using composite materials.</p> <p>Theoretical content of the subject area - concepts and principles of physical processes, mechanics of deformed solids, technical mechanics, hydraulics, aero- and gas dynamics, thermal physics and electrical engineering.</p> <p>Methods, techniques and technologies – analytical, numerical and experimental methods of researching the problems of the subject area, including integrated computer technologies, methods and technologies related to the stages of development and manufacture of rocket-space engineering structures.</p> <p>Instruments and equipment - laboratory equipment with measuring instruments, in particular hydraulic stands, wind tunnels, equipment for studying the properties of materials, stress-strain state of structures; training laboratories for studying the structures of rocket-space engineering, equipment used for the manufacture, assembly and testing of structures of rocket-space engineering, including from composite materials; computers with information and specialized software, in particular computer calculation systems, geometric modelling, finite element analysis, integrated design and manufacture of rocket-space engineering structures.</p>
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Orientation of the educational programme	The bachelor's educational and professional is intended for students who want to become specialists in the design and manufacture of rocket-space engineering structures.
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Main focus of the educational and professional programme (specialisation)	The educational and professional programme establishes the qualification requirements for the social and production activities of graduates of a higher education institution in the specialty 134 «Aerospace Engineering» of the educational degree «Bachelor» and state requirements for the properties and qualities of a person who has received a certain educational level of the appropriate professional direction according to the educational and professional programme «Rocket-Space Engineering».
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Features of the programme	<p>The educational programme is aimed at studying the choice of general accounting, rocket-space engineering layout, calculations of composite materials and structures based on them, creation of technological processes for the manufacture of rocket-space engineering structures, including those made of composite materials, development of structural solutions for rocket-space engineering structures, including those made of composite materials, using information and additive technologies.</p> <p>The internship is conducted at enterprises that manufacture rocket-space engineering structures, including those made of composite materials.</p>
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4 – Suitability of graduates for employment and further education

Suitability for employment	A bachelor can hold primary positions of master, mechanic, technician, designer, technologist at enterprises and design organisations of the aviation, rocket and space and mechanical engineering industries, as well as in other
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	institutions, involving the development, manufacture and testing of rocket-space engineering, as well as in other institutions as a technician of structural units Places of employment: research, design and development, manufacturing, public and private enterprises engaged in the development and creation of rocket-space engineering, including composite materials.
Further education	Continuing education at the second (master's) level to obtain a «Master» degree. Acquisition of additional qualifications in the postgraduate education system.
5 – Teaching and assessment	
Teaching and learning	Student-centered learning, self-learning, problem-oriented learning is aimed at developing critical and creative thinking, learning through laboratory and industrial practice, dual, distance education, etc. Lectures, multimedia lectures, laboratory work, seminars, practical classes in small groups, independent work based on textbooks and notes, consultations with teachers, preparation of a bachelor's work.
Assessment	Written exams, practice reports, essays, presentations, current (modular) control, bachelor's qualification work and its protection.
6 – Programme competences	
Integral competence	The ability to solve complex specialised and practical problems related to the creation of rocket-space engineering structures, including those made of composite materials, which involves the application of mechanical engineering theories and methods, and is characterised by complexity and uncertainty of conditions.
General competences (GC)	GC1. Ability to communicate in the state language both orally and in writing. GC2. Ability to communicate in a foreign language. GC3. Safe work practices, commitment to environmental protection GC4. Skills in the use of information and communication technologies. GC5. Ability to work in a team. GC6. Ability to generate new ideas (creativity). GC7. Ability to make informed decisions. GC8. Ability to learn and master modern knowledge. GC9. Ability to exercise one's rights and responsibilities as a member of society, to understand the values of civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine. GC10. Ability to preserve and increase moral, cultural, scientific values and achievements of society based on an understanding of 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, technique and technology, to use various types and forms of physical activity for recreation and healthy lifestyle.

<p>Special (professional) competences (PC)</p>	<p>PC1. Use of the mathematical apparatus in solving problems in the field of design and manufacture of rocket-space engineering.</p> <p>PC2. Ability to describe the interaction of bodies with each other, as well as with the gas and hydraulic environment, based on basic knowledge of the main sections of physics, mechanics, electrostatics, electrodynamics, optics, aero, gas and hydrodynamics.</p> <p>PC3. To make a qualified choice of material class for parts and products of rocket-space engineering based on knowledge of the basic structure of metals and non-metals and methods of modifying their properties.</p> <p>PC4. Ability to perform strength calculations of rocket-space engineering elements.</p> <p>PC5. Ability to design and test elements of rocket-space engineering, its equipment, systems and subsystems.</p> <p>PC6. Ability to develop and implement technological processes for the manufacture of elements and objects of rocket-space engineering.</p> <p>PC7. Skills in the use of information and communication technologies and specialised software in education and professional activities.</p> <p>PC8. Ability to take into account the economic and managerial aspects of the manufacture of elements and objects of rocket-space engineering in professional activities.</p> <p>PC9. Ability to use theories of flight dynamics and control in the design of rocket-space engineering objects.</p> <p>PC10. Ability to use appropriate software (programming languages, packages) for calculations and design of rocket-space engineering structures.</p>
<p>7 – Programme learning outcomes</p>	
<p>Programme learning outcomes (PO)</p>	<p>PO1. Freely communicate orally and in writing in state and foreign languages on professional issues.</p> <p>PO2. Understand the environmentally hazardous and harmful factors of professional activity and adjust its content to prevent negative environmental impact.</p> <p>PO3. To master the means of modern information and communication technologies to the extent sufficient for study and professional activity.</p> <p>PO4. Explain their decisions and the basis for their adoption to specialists and non-specialists in a clear and unambiguous form.</p> <p>PO5. Possess the skills of independent learning and autonomous work to improve professional skills and solve problems in a new or unfamiliar environment.</p> <p>PO6. To formulate reasonable assessments of the actions of state bodies and other political institutions from the standpoint of universal and democratic values, the priority of human and civil rights and freedoms.</p> <p>PO7. Possess the logic and methodology of scientific knowledge based on an understanding of the current state and methodology of the subject area.</p> <p>PO8. Comply with the requirements of industry regulations on the procedures for designing, manufacturing, testing and (or) certification of rocket-space engineering elements and objects at all stages of their life cycle.</p> <p>PO9. Explain the influence of design parameters of rocket-space engineering elements on its flight characteristics. Understand the methods of ensuring the stability and controllability of rocket-space engineering.</p> <p>PO10. Have the skills to determine loads on structural elements of rocket-space engineering at all stages of its life cycle.</p> <p>PO11. Understand the principles of fluid and gas mechanics, in particular, hydraulics, aerodynamics (gas dynamics).</p> <p>PO12. Describe the structure of metals and non-metals and know how to modify their properties. Designate optimal materials for rocket-space engineering elements and systems, taking into account their structure, physical, mechanical, chemical and operational properties, as well as economic factors.</p>

	<p>PO13. Understand the features of work processes in hydraulic, pneumatic, electrical and electronic systems used in rocket-space engineering.</p> <p>PO14. Describe experimental methods for studying structural, physical, mechanical and technological properties of materials and structures.</p> <p>PO15. Apply in professional activities modern methods of design, construction and manufacture of elements and systems of rocket-space engineering.</p> <p>PO16. Calculate the stress-strain state, determine the bearing capacity of structural elements and the reliability of rocket-space engineering systems.</p> <p>PO17. Understand and justify the sequence of design, manufacture, testing and (or) certification of rocket-space engineering elements and systems.</p> <p>PO18. Understand the structure and principles of operation of onboard equipment of rocket-space engineering.</p> <p>PO19. Understand and justify design features and main aspects of working processes in systems and elements of rocket-space engineering.</p> <p>PO20. Understand the theoretical principles and practical methods of instrumental support for the interchangeability of rocket-space engineering parts.</p> <p>PO21. Have skills in developing technological processes, including the use of computer-aided design for the production of structural elements and systems of rocket-space engineering.</p> <p>PO22. Assess the economic efficiency of the manufacture of rocket-space engineering elements and systems.</p>
8 – Resource support for programme implementation	
Personnel support	<p>Scientific and pedagogical staff involved in the implementation of the educational programme meet the requirements for ensuring the implementation of educational activities in the field of higher education in accordance with the current legislation of Ukraine (Resolution of the Cabinet of Ministers of Ukraine «On Approval of Licensing Conditions for the Conduct of Educational Activities of Educational Institutions» of 30.12.2015 № 1187 as amended)</p>
Material and technical support	<p>The material and technical support meets the requirements of the Licensing Conditions for Educational Activities in the Field of Higher Education in accordance with the current legislation of Ukraine (Resolution of the Cabinet of Ministers of Ukraine «On Approval of Licensing Conditions for the Conduct of Educational Activities of Educational Institutions» of 30.12.2015 № 1187 as amended) and ensures the conduct of all types of classes and practices provided for in the curriculum.</p> <p>The training is carried out in the educational laboratories, computer labs of the Department of Design of Rocket Technology, the Department of Space Technology and Non-Traditional Energy Sources, the Department of Composite Structures and Aviation Materials Science, and other 12 departments of the National Aerospace University «Kharkiv Aviation Institute».</p>
Information and educational methodological support	<p>In accordance with the requirements of the Licensing Conditions for Educational Activities in the Field of Higher Education in accordance with the current legislation of Ukraine (Resolution of the Cabinet of Ministers of Ukraine «On Approval of Licensing Conditions for the Conduct of Educational Activities of Educational Institutions» of 30.12.2015 № 1187 as amended) it includes library resources, electronic learning resources, the website of the National Aerospace University «Kharkiv Aviation Institute» and the websites of the departments that train students, which contain basic information on educational activities according to the educational and professional programme. Use of the virtual learning environment of the National Aerospace University «Kharkiv Aviation Institute» and the author's developments of the scientific and pedagogical staff.</p>
9 – Academic mobility	
National credit	On the basis of bilateral agreements between the National Aerospace

mobility	University «Kharkiv Aviation Institute» and technical institutions of Ukraine.
International credit mobility	On the basis of bilateral agreements between the National Aerospace University «Kharkiv Aviation Institute» and educational institutions of partner countries.
Training of foreign applicants for higher education	Foreign citizens are educated in the state language or in English. If education is provided in the state language, in certain cases, a decision may be made to teach one or more disciplines in English and/or other foreign languages.

3 LIST OF COMPONENTS OF THE EDUCATIONAL AND PROFESSIONAL PROGRAMME (CEP) AND THEIR LOGICAL SEQUENCE

3.1 List of components of the EP

Code CEP	Components of the educational program (disciplines, term papers (works), practices, qualification work)	Number of credits	Form of final control
1	2	3	4
MANDATORY COMPONENTS OF THE EP			
Mandatory components of the EP according to the standard			
MC1	Linear algebra and analytical geometry	5	exam
MC2	Ukrainian Language for professional communication	3	credit
MC3	Geometric modelling and graphic information technology	10	exam
MC4	Mathematical analysis	10	exam
MC5	Physics	10	exam
MC6	Materials science	5,5	exam
MC7	Foreign Language	6	credit /dif.credit
MC8	Theoretical Mechanics and Theory of Mechanisms and Machines	10	exam
MC9	Theoretical Mechanics and Theory of Mechanisms and Machines (TP)	2	dif.credit
MC10	Technology of Structural Materials	7	credit
MC11	Mechanics of Materials and Structures	10	exam
MC12	Interchangeability and Standardization	5	exam
MC13	Design of Machine Elements	5	exam
MC14	Design of Machine Elements (TP)	2	dif.credit
MC15	Electrical Engineering	3	exam
MC16	Thermodynamics and Heat Transfer	3,5	credit
MC17	Programming methods and computer methods of computing	5	exam
MC18	Introduction to the speciality	4,5	credit
MC19	Technical and economic assessment of manufacture	3	credit
MC20	Academic Training (graphic information technology)	3	credit
MC21	Introductory Training	3	credit
MC22	Industrial Training	4	credit
MC23	Graduation Thesis of the Bachelor	9	protection work
Unique educational components by standard			
MC24	General Structure of Space-Rocket Engineering	3,5	exam
MC25	Design of Space-Rocket Engineering Structures	4	exam
MC26	Design of Space-Rocket Engineering Structures (TP)	2	dif.credit
MC27	Aerogas hydrodynamics	4,5	exam
MC28	Design of Composite Structures of Space-Rocket Engineering	4	exam
MC29	Computer-Aided Design Technologies for Space-Rocket Engineering Structures	3	credit
MC30	Technology of Manufacture of Space-Rocket Engineering Structures	4	exam
MC31	Computer Methods for Calculating Structures of Space-Rocket Engineering Technology	4	exam
MC32	Experimental Support for Design of Space-Rocket Engineering Structures	3	exam
Total amount of mandatory components:		160,5	
SELECTIVE COMPONENTS OF THE EP*			
Humanitarian block (Soft skills)*			

SB1	Legal competence	3	credit
SB2	Formation of a systematic scientific outlook	3	credit
SB3	Social and humanitarian discipline of choice	3	credit
1	2	3	4
Individual selective disciplines			
<i>Disciplines of individual choice **</i>			
SB4	Special sections of mathematics	5	exam
SB5	Discipline of individual choice 1	5	exam
SB6	Discipline of individual choice 2	5	exam
SB7	Discipline of individual choice 3	5	exam
<i>Selective block. Block of professional disciplines Major***</i>			
SB1.1	Major. Discipline 5.1	5	exam
SB1.2	Major. Discipline 6.1	4	exam
SB1.3	Major. Discipline 6.2	4,5	exam
SB1.4	Major. Discipline 7.1	5,5	exam
SB1.5	Major. Discipline 7.2	4	exam
SB1.6	Major. Discipline 7.3	2	dif.credit
SB1.7	Major. Discipline 8.1	3,5	credit
SB1.8	Major. Discipline 8.2	2	dif.credit
<i>Selective block. Block of disciplines of competence MINOR****</i>			
SM1.1	Minor. Discipline 1	5	exam
SM1.2	Minor. Discipline 2	5	exam
SM1.3	Minor. Discipline 3	5	exam
SM1.4	Minor. Discipline 4	5	exam
Total amount of selective components:		79,5	
TOTAL AMOUNT OF THE EDUCATIONAL PROGRAMME		240	

*The applicant chooses one discipline from the lists/blocks of educational components SB1 - SB3, thereby ensuring the mastery and deepening of general competencies and learning outcomes aimed at acquiring social skills in accordance with the requirements of the specialty standard. The lists of components of the educational components of the SB1 - SB3 may be increased and updated by the decision of the industry EMC.

** A university-wide block in which disciplines are offered by University departments or other units in accordance with their areas of activity or research areas/schools.

*** The applicant can choose any block of disciplines of the professional direction MAJOR. Blocks of disciplines of the MAJOR professional direction can be increased and updated by the decision of the industry EMC

**** The applicant can choose any block of disciplines of the competent direction MINOR. Blocks of disciplines of the MINOR competence area can be increased and updated by the decision of the industry EMC

An applicant who is enrolled on the basis of complete general secondary education completes an educational and professional programme in the amount of 240 ECTS credits.

Applicants who are enrolled on the basis of the degree of «professional junior bachelor», «junior bachelor» (educational qualification level «junior specialist») – 240 ECTS credits. At the same time, KhAI recognises and re-credits no more than 60 ECTS credits obtained within the previous educational programme of training for a professional junior bachelor, junior bachelor (junior specialist).

In accordance with the principles of the competence-based approach to higher education, the results of the disciplines previously passed by the applicant in accordance with the individual curriculum are re-calculated at the applicant's request on the basis of the Regulation «On re-examination of educational disciplines and determining the academic difference in the National Aerospace University «Kharkiv Aviation Institute»» (<https://khai.edu.ua/university/normativna-baza/polozheniya1/polozhennya-yaki-regulyuyut-poryadok-zdijsnennya-osvitnogo-procesu/polozhennya-pro-poryadok-perezarahuvannya/>) by comparing: compliance of the content of the discipline with the educational and professional programme (EPP); planned learning outcomes for the relevant discipline; total volume in hours and ECTS credits; forms of final control, etc.

3.2 Distribution of educational components of the educational programme (CEP) by courses and semesters

The list of disciplines, practices and certification is based on the requirements of higher education standards in the speciality 134 «Aerospace Engineering» for the first (bachelor's) level of higher education, the Regulation «On the Organisation of the Educational Process at KhAI» (<https://khai.edu.ua/university/normativna-baza/polozheniya1/polozhennya-yaki-regulyuyut-poryadok-zdiysnennya-osvitnogo-procesu/polozhennya-pro-organizaciyu-osvitnogo-procesu/>) and relevant regulatory documents.

Practices and/or internships (of all types) are part of the mandatory academic disciplines. The number of forms of control per academic year does not exceed sixteen. The audit load is from 33 to 50 percent of the total load and does not exceed 28 academic hours per week.

The distribution of the educational components of the educational programme (CEP) by courses and semesters is provided in Appendix A

3.3 Structural and logical scheme of the EP

The structural and logical scheme (Appendix B) of the educational programme reflects the sequence of study of its components, both mandatory and selective. The applicant for higher education chooses an individual learning path, which is implemented through the selection of elective components in accordance with the Regulation «On Ensuring the Right of Students to Choose Academic Disciplines».

4 FORM OF CERTIFICATION OF HIGHER EDUCATION APPLICANTS

Certification of graduates in the educational and professional programme «Rocket-Space Engineering» in specialty 134 «Aerospace Engineering» is carried out in the form of defence of a bachelor's thesis and ends with the issuance of a document of the established form on awarding a bachelor's degree with the award of an educational qualification: Bachelor of Aerospace Engineering, field of knowledge Mechanical Engineering.

Certification is carried out openly and publicly.

5 MATRIX OF CORRESPONDENCE OF PROGRAM COMPETENCIES TO MANDATORY COMPONENTS OF EPP

Programme competences	Компоненти освітньої програми																																					
	MC1	MC2	MC3	MC4	MC5	MC6	MC7	MC8	MC9	MC10	MC11	MC12	MC13	MC14	MC15	MC16	MC17	MC18	MC19	MC20	MC21	MC22	MC23	MC24	MC25	MC26	MC27	MC28	MC29	MC30	MC31	MC32						
GC1		+							+					+				+	+				+			+												
GC2							+															+	+				+				+							
GC3						+				+									+			+	+	+								+						
GC4			+				+											+			+		+	+							+		+					
GC5		+																				+	+	+														
GC6										+					+									+				+										
GC7									+						+									+							+		+					
GC8		+	+															+		+			+									+						
GC9																							+	+											+			
GC10																				+		+	+	+														
PC1	+			+	+																			+														
PC2					+			+	+							+	+							+					+									
PC3						+				+														+						+	+	+						
PC4											+		+	+										+	+										+	+		
PC5				+				+	+			+	+	+							+			+	+	+	+		+	+							+	
PC6										+		+							+			+	+	+											+			
PC7				+																		+		+														
PC8																						+	+		+	+	+									+		
PC9																								+	+													
PC10				+														+			+		+		+										+		+	

6 MATRIX OF CORRESPONDENCE OF PROGRAMME LEARNING OUTCOMES (PO) TO MANDATORY COMPONENTS OF EPP

Programme competences	Компоненти освітньої програми																																							
	MC1	MC2	MC3	MC4	MC5	MC6	MC7	MC8	MC9	MC10	MC11	MC12	MC13	MC14	MC15	MC16	MC17	MC18	MC19	MC20	MC21	MC22	MC23	MC24	MC25	MC26	MC27	MC28	MC29	MC30	MC31	MC32								
PO1		+					+		+					+					+			+	+	+				+												
PO2																			+			+	+											+						
PO3			+				+											+			+										+					+				
PO4														+						+	+			+																
PO5	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
PO6																				+		+	+																	
PO7	+																											+								+				
PO8			+										+	+						+			+	+	+	+	+		+						+		+			
PO9																								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
PO10							+	+		+		+	+	+	+	+										+	+	+	+	+	+	+	+	+	+	+	+	+	+	
PO11					+											+													+											
PO12						+				+												+					+			+						+				
PO13															+	+									+	+	+													
PO14					+	+					+				+	+																							+	
PO15																								+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	
PO16				+							+		+	+										+		+	+		+	+						+				
PO17																				+	+			+	+	+									+		+		+	
PO18																				+					+	+														
PO19																									+	+														
PO20			+									+																										+		
PO21																								+													+		+	
PO22																					+			+	+												+		+	

Appendix A

Distribution of educational components of the educational programme (CEP) by courses and semesters

1st year				2nd year				3rd year				4th year			
1 semester		2 semester		3 semester		4 semester		5 semester		6 semester		7 semester		8 semester	
CEP	number of credits	CEP	number of credits	CEP	number of credits	CEP	number of credits	CEP	number of credits	CEP	number of credits	CEP	number of credits	CEP	number of credits
MC7	3	MC4	5	MC4	5	MC21	3	SM1.1	5	MC14	2	SM1.3	5	MC23	9
SB1	3	MC5	5	MC5	5	SB4	5	MC13	5	MC22	4	SB6	5	SM1.4	5
MC2	3	MC20	3	MC12	5	MC11	5	SB2	3	MC19	3	SB1.4	5,5	SB7	5
MC17	5	MC7	3	MC11	5	MC24	3,5	SB1.1	5	SM1.2	5	SB1.5	4	MC31	4
MC18	4,5	MC3	5	MC8	5	MC15	3	MC26	2	SB5	5	SB1.6	2	MC32	3
MC3	5	MC6	5,5	MC10	3,5	MC9	2	MC27	4,5	SB1.2	4	MC29	3	SB1.7	3,5
MC1	5	MC8	5			SB3	3	MC25	4	MC28	4	MC30	4	SB1.8	2
						MC16	3,5			SB1.3	4,5				
						MC10	3,5								
28,5		31,5		28,5		31,5		28,5		31,5		28,5		31,5	
60				60				60				60			

All components (mandatory and selective), their content, formation of competences (general, special (professional)) and definition of learning outcomes are presented in the work programmes of disciplines and/or syllabi on the website in the section «Brief description, structure and educational components of educational programmes and components» (separately for each course of study) of the educational and professional programme Rocket-Space Engineering, speciality 134 «Aerospace Engineering»: <https://khai.edu.ua/education/osvitni-programi-i-komponenti/osvitni-programi-bakalavriv/raketno-kosmichna-tehnika/>

Appendix B

STRUCTURAL AND LOGICAL SCHEME OF THE EDUCATIONAL AND PROFESSIONAL PROGRAMME

