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

Department of Information Technologies of Design (№ 105)

APPROVE

Head EMC 2
(signature) Dmytro Kritskiy (name and surname)
«31» 08 2023 p.

CURRICULUM *SELECTIV*
ACADEMIC DISCIPLINE
Computer-aided Design Systems. Part 2
(the name of the academic discipline)

Field of knowledge: "Mathematics and Statistics", "Information Technology", "Automation and Instrumentation", "Chemical and Bioengineering", "Electronics and Telecommunications", "Natural Sciences", "Architecture and Construction"
(code and name of the field of knowledge)

Specialty: all specialties of the given fields of knowledge
(code and name of the field of Specialty)

Educational program: all educational programs of the given fields of knowledge
(name of the educational program)

Form of study: full-time

Level of higher education:
second (master's)

Kharkiv 2023

Developer: Mariia Pyvovar, Assistant of department information technologies of design

Dmytro Kritskiy, PhD, docent of department information technologies of design

(surname and name, position, scientific degree and academic title) _____

(signature)

The curriculum was considered at the meeting of the Department of Information Technology Design _____

(the name of the department)

Protocol № 1_ from « _30_» ___08___2023 p..

Head of department 105 _____ Andrii Bykov

(signature) (name and surname)

1. Description of the discipline

<table>
<tr><td>Name of indicators</td><td>Field of knowledge,
training direction,
education level</td><td>Characteristics of the discipline</td></tr>
<tr><td>Number of credits – 3</td><td rowspan="11">Field of knowledge
"Mathematics and Statistics", "Information Technology", "Automation and Instrumentation", "Chemical and Bioengineering", "Electronics and Telecommunications", "Natural Sciences", "Architecture and Construction"
(code and name of the field of knowledge)

Specialty
all specialties of the given fields of knowledge
(code and name of the field of Specialty)

Educational program
all educational programs of the given fields of knowledge
(name of the educational program)

Level of higher education:
second (master's)</td><td>Selective</td></tr>
<tr><td>Modules – 2</td><td>Year of preparation:</td></tr>
<tr><td>Content modules – 4</td><td>2023/2024</td></tr>
<tr><td>Individual task not provided</td><td>Semester</td></tr>
<tr><td rowspan="2">The total number of hours – 48 / 90</td><td>2</td></tr>
<tr><td>Lectures *</td></tr>
<tr><td rowspan="6">Weekly hours for full-time study:
classroom – 3
independent work of the student – 2,63</td><td>0</td></tr>
<tr><td>Practical, seminar*</td></tr>
<tr><td>48</td></tr>
<tr><td>Laboratory *</td></tr>
<tr><td>0</td></tr>
<tr><td>Individual work</td></tr>
<tr><td>42</td><td>Type of control</td></tr>
<tr><td>modular control, test</td></tr>
</table>

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The ratio of the number of hours of classroom classes to independent work is: *1,14.*

* Classroom load can be reduced or increased by one hour depending on the class schedule.

2. The purpose and objectives of the discipline

The purpose of studying the discipline is to prepare students to perform work on pre-design analysis of objects, processes and design systems during the development of automated systems for design and technological purposes, as well as to develop in students professional language competencies that will facilitate their effective functioning in the educational and work space and provide the necessary communication ability in oral and written form.

The main objectives of the discipline are the formation of students' basic system concepts and skills, a holistic vision of the modern technosphere, strengthening interdisciplinary links, the development of systems thinking, without which the effective use of information technology is impossible, development of students' competence in a foreign language, which has its own specificity depending on their specialization, formation of communication skills in a foreign language on professional topics, students' work with specialized literary sources, electronic resources, orienting them to the importance of practical application of acquired theoretical knowledge.

Competencies to be acquired. The discipline should help students to develop the following general and special competencies:

1. Ability to abstract thinking, analysis and synthesis.
2. Ability to communicate in a foreign language.
3. Ability to communicate with representatives of other professional groups at different levels (with experts from other fields of knowledge/types of economic activity).
4. The ability to evaluate and ensure the quality of the work performed
5. The ability to apply information technologies, which are necessary for solving strategic and current problems.
6. The ability to formulate requirements for the stages of the life cycle of information systems.
7. The ability to use modern data analysis technologies to optimize processes in information systems.

Expected learning outcomes. As a result of studying the discipline, applicants must achieve the following learning outcomes:

1. Search for necessary information in scientific and technical literature, databases, other sources, analyze and evaluate this information.
2. Communicate freely in national and foreign languages in scientific, industrial and social spheres of activity.
3. Make effective decisions on the problems of information infrastructure development, creation and application of IT.
4. Justify the choice of technical and software solutions, taking into account their interaction and potential impact on solving organizational problems, organize their implementation and use.
5. Make a reasonable choice of project solutions and design a service-oriented information architecture of the enterprise (institution, organization, etc.).
6. Solve the problems of digital transformation in new or unknown environments based on specialized conceptual knowledge, including modern scientific achievements in the field of information technology, research and integration of knowledge from various fields.

3. The program of the discipline

Module 1.

Content module 1. PURPOSE AND FUNCTIONS OF AUTOMATED SYSTEMS IN THE LIFE CYCLE OF A TECHNICAL OBJECT.

Topic 1. The life cycle of a technical object. Phases of the product life cycle. The composition and content of the tasks of creating new technology. The composition of data on the technical object by phases of the life cycle.

Topic 2. Systems of automation of a life cycle of technical object. Types of automated systems (AS): design and control automation systems. The role of systems analyst in creating automated systems. The purpose and objectives of the discipline.

Content module 2. SUBJECT AREA AND BASIC CONCEPTS OF SYSTEMS ANALYSIS.

Topic 3. Basic concepts of systems theory. System models. Concepts and features of systems: properties, relations, function, structure.

Topic 4. Complex systems. Subject and methods of system analysis in engineering. Features of complex systems. Measures of system complexity. Signs of complex systems. Synergistic effect. The subject of system analysis. Methods of system analysis. Decomposition and aggregation of the system model. General order of decomposition.

Topic 5. Basic concepts of engineering systemology**.** Methods of classification of systems. Systemological classification. Types of relationships between objects. Ascending systems, data systems, generating systems, structured systems, metasystems.

Topic 6. Basic concepts of design activities. Project, design decision, design documents, design procedures and operations. Decomposition of the design process, projected and projecting systems. Stages of development of a technical object.

Module 2.

Content module 3. SCIENTIFIC AND BUSINESS COMMUNICATION IN A FOREIGN LANGUAGE – GRAMMAR.

Topic 7. Word formation. Order of words in a sentence.

Topic 8. Expression of modality. Expression of intention, possibility, confidence, desirability.

Topic 9. Passive constructions. Impersonal forms of the verb. The infinitive and its constructions.

Topic 10. Conditional mode of the verb. Form would + Infinitive.

Topic 11. Adjective. Adverb. Degrees of comparison.

Topic 12. Complex sentences and complex sentences.

Content module 4. SCIENTIFIC AND BUSINESS COMMUNICATION IN A FOREIGN LANGUAGE – VOCABULARY.

Topic 13. Features of the functioning of the scientific style. Analytical processing of foreign language sources (printed and electronic) in order to obtain the necessary information.

Topic 14. The essence of annotation and abstracting. Types of essays. Scientific articles and theses.

Topic 15. Scientific report. Basic requirements and structure.

Topic 16. Preparation of technical documentation and instructions for using the software.

Topic 17. Forming a resume. Writing a motivational letter and cover letter.

Topic 18. Compilation of a dictionary of technical terms by specialty.

4. The structure of the discipline

Names of content modules and topics	Number of hours				
	total	including			
		l	p	lab.	i. w.
1	2	3	4	5	6
Module 1					
Content module 1. Purpose and functions of automated systems in the life cycle of a technical object					
Topic 1. The life cycle of a technical object	3	-	2	-	1
Topic 2. Systems of automation of a life cycle of technical object	3	-	2	-	1
Together on the content module 1	6	-	4	-	2
Content module 2. Subject area and basic concepts of systems analysis					
Topic 3. Basic concepts of systems theory. Systems models	5	-	3	-	2
Topic 4. Complex systems. Subject and methods of system analysis in engineering	5	-	3	-	2
Topic 5. Basic concepts of engineering systemology	5	-	3	-	2
Topic 6. Basic concepts of design activities	5	-	3	-	2
Together on the content module 2	20	-	12	-	8
Total hours for module 1	26	-	16	-	10
Module 2					
Content module 3. Scientific and business communication in a foreign language – Grammar.					
Topic 7. Word formation. Order of words in a sentence.	4	-	2	-	2
Topic 8. Expression of modality. Expression of intention, possibility, confidence, desirability.	5	-	3	-	2
Topic 9. Passive constructions. Impersonal forms of the verb. The infinitive and its constructions.	5	-	3	-	2
Topic 10. Conditional mode of the verb. Form would + Infinitive.	5	-	3	-	2
Topic 11. Adjective. Adverb. Degrees of comparison.	4	-	2	-	2
Topic 12. Complex sentences and complex sentences.	5	-	3	-	2
Together on the content module 3	28	-	16	-	12
Content module 4. Scientific and business communication in a foreign language – Vocabulary					

Topic 13. Features of the functioning of the scientific style.	5	-	2	-	3
Topic 14. The essence of annotation and abstracting. Types of essays. Scientific articles and theses.	6	-	3	-	3
Topic 15. Scientific report. Basic requirements and structure.	6	-	3	-	3
Topic 16. Preparation of technical documentation and instructions for using the software.	6	-	3	-	3
Topic 17. Forming a resume. Writing a motivational letter and cover letter.	6	-	3	-	3
Topic 18. Compilation of a dictionary of technical terms by specialty.	5	-	2	-	3
Together on the content module 4	34	-	16	-	18
Total hours for module 2	62	-	32	-	30
control measure	2	-	-	-	2
Total hours for discipline	90	-	48	-	42

5. Topics of seminars

Seminars are not provided in the curriculum.

6. Topics of practical classes

№ s / n	Name topics	Number hours
1.	Application system developer tool environment.	4
2.	Examples of implementation of specialized design systems.	4
3.	Functions of the editor of information models of objects.	4
4.	Development of a structural model of the design object.	4
5.	Definition and classification of properties of the design object.	4
6.	Analytical processing of foreign language sources	4
7.	Annotation of scientific article	4
8.	Scientific report	6
9.	Writing a motivational letter	6
10.	Compilation of a dictionary of technical terms by specialty	6
11.	Modular control work.	2
	Together	48

7. Topics of laboratory classes

Laboratory classes are not provided in the curriculum

8. Independent work

№ s / n	Name topics	Number hours
1.	Functions of the editor of the information model of the object. Construction and use of a conceptual graph of an object class.	4
2.	Features of the organization of the process of designing objects of aerospace technology.	4
3.	Relationship of knowledge base methods with the information model of the object.	5

4.	IDEF0 functional analysis methodology. Software for functional systems analysis (Design / IDEF, AllFusion Process Modeler (BPWin), Borland Together, ARIS Business Architect, etc.).	5
5.	Gerund forms. Coordination of times.	5
6.	Syntax of business correspondence. Grammatical features of scientific texts.	5
7.	Business professional communication in a specific field. Business written communication.	6
8.	Problems of computer translation of English texts. Scientific reports and presentations.	6
	Together	40

9. Individual task

Individual tasks are not provided by the curriculum.

10. Teaching methods

When practice work and independent work, such teaching methods as verbal (explanation, story, conversation, educational discussion, etc.) are used; visual (illustration, demonstration, self-observation) and practical, elements of multimedia course support (video fragments), demonstrations of individual techniques and / or handouts in the form of diagrams and charts.

Practical work is performed using training (demonstration) and licensed software.

Independent work includes preparation for laboratory work, modular control and test, performance outside the classroom of the individual task and the study of the above topics in the abstract, literature sources and program documentation.

11. Control methods

The control is carried out in accordance with the "Regulations on the modular rating system for assessing students' knowledge."

Current control - in accordance with the completeness, quality and timeliness of practical work; intermediate (modular) control - written tests at the 8th and 16th weeks; final control - written test.

12. Evaluation criteria and distribution of points received by students

12.1. Distribution of points received by students (quantitative evaluation criteria)

Components of educational work	Points for one lesson (task)	Number of classes (tasks)	Total number of points
Module 1			
Execution and protection of practical works	0...5	5	0...25
Modular control	0…25	1	0…25
Module 2			
Execution and protection of practical works	0...5	5	0...25
Modular control	0…25	1	0…25
Total for the semester			**0…100**

Semester control (test) is carried out in case of refusal of the student from points of current testing and in the presence of the admission to credit. During the semester test the student has the opportunity to receive a maximum of 100 points.

The ticket for the test consists of 4 questions, each question is evaluated in 25 points, 2 questions are theoretical, 2 questions are practical - the sum of 100 points.

12.2 Criteria for evaluating student work during the semester

Satisfactorily (60-74). Show a minimum of knowledge and skills. Defend all individual tasks and pass the test.

Fine (75-89). Firmly know the minimum, defend all individual tasks, perform all practical tasks, pass testing and out of classroom independent work.

Perfectly (90-100). Pass all checkpoints with a grade of "excellent". Thoroughly know all the topics and be able to apply them.

Grading scale: point and traditional

The sum of points	Score on a traditional scale	
	Exam	Test
90 – 100	Perfectly	Good
75 – 89	Fine	
60 – 74	Satiasfactofily	
0 – 59	Unsatisfactorily	Bad

13. Methodical support

The entire scientific and methodological set of the discipline is posted on the official educational portal of the National Aerospace University "Kharkiv Aviation Institute".

1. Granin V.Yu. System analysis. Lecture notes (in electronic form). 2020 (Edition Kritskiy D.M.).

14. Recommended Books

1. Англійська мова за професійним спрямуванням: навчально-методичний посібник для студентів ОС «Бакалавр» спеціальності «Транспортні технології» / Н.В. Яременко – К.: ЦП «Копмринт», 2017. – 124 с.

2. Гальчак Т.В. Англійська мова для студентів спеціальності 274 “Автомобільний транспорт” / Гальчак Т.В. – ВІКТ ВП НУБіП України «БАТК», 2019.- 70 с.

3. Кухарська В.Б. Англійська мова для студентів харчових спеціальностей: навчально-методичний посібник. – 2-ге вид., переробл. та доповн. – К.: Фірма «ІНКОС», 2018. – 352 с.

4. Dignen, Bob. Communicating Across Cultures Student's Book with Audio CD. Cambridge University Press, 2011.

5. Dubicka, Iwonna, et al. Business partner B1+: coursebook. Pearson, 2018.

6. Guy Wellman. Wordbuilder. Vocabulary development and practice for higher- level students. Heinemann. 2017. – 266 p.

7. Murphy Raymond. English Grammar in Use. Cambridge University Press, 2021. - 128 p.

8. Sandford, George. Cambridge English for Human Resources Student's Book with Audio CDs (2). Cambridge University Press, 2011.

9. Journals "CAD and Graphics", "Information Technology", "Information Technology in Design and Production", "Computer Aided Design and Document Management (EFFICIENCY)", "CADmaster", "CAD / CAM / CAE Observer".