Ministry of Education and Science of Ukraine
National Aerospace University
"Kharkiv Aviation Institute"

Department *Aircraft engine design* (No. *203*)

APPROVED

Chairman of the ScMC #1

Serhii NYZHNYK
(signature) (first and last name)

" *30* " *08* 2023

SYLLABUS OF A *MANDATORY* ACADEMIC DISCIPLINE

PRACTICAL TRAINING

(name of academic discipline)

Field of education *13 Mechanical Engineering*
(code and name of a field of education)

Field of study *134 Aerospace Engineering*
(code and name of field of study)

Educational program *Design, Operational Diagnostics, Maintenance and Repair of Aircraft Engines and Power Plants*
(code and name of educational program)

Form of study: full-time

Academic degree: *First (Bachelor)*
(academic degree)

Kharkiv 2023

Person, who developed the syllabus — *Serhii BEZUGLYI, Associate Professor* (author, position, academic degree and rank) (signature)

The syllabus was approved at the meeting of the department
Aircraft Engine Design (No. 203)
(department)

Minutes No. *1* dated *" 28 " August* 2023.

Head of the department — *DSc., Professor* (academic degree and rank) (signature) *Serhii YEPIFANOV* (first and last name)

1. Description of the discipline

<table>
<tr><td>Characteristics</td><td>Branch of science,
specialization,
academic degree</td><td>Description of the discipline
(full-time tuition)</td></tr>
<tr><td>Credits – 3</td><td>Field of education:
13 Mechanical Engineering
(cipher and name)</td><td>Mandatory</td></tr>
<tr><td>Modules –</td><td rowspan="4">Field of study:
134
Aerospace Engineering
(cipher and name)</td><td>Academic year</td></tr>
<tr><td>Semantic modules –</td><td>2023 / 2024</td></tr>
<tr><td>Individual task
–
(title)</td><td>Semester</td></tr>
<tr><td>Total number of academic hours –
0 * / 90</td><td>6-th</td></tr>
<tr><td rowspan="11">Number of academic hours
for full-time tuition:
auditorium – 0
independent work – 30</td><td rowspan="11">Educational program:
Design, Operational Diagnostics, Maintenance and Repair of Aircraft Engines and Power Plants
Higher education:
First (Bachelor)</td><td>Lectures *</td></tr>
<tr><td>–</td></tr>
<tr><td>Practical activities *</td></tr>
<tr><td>–</td></tr>
<tr><td>Laboratory activities *</td></tr>
<tr><td>–</td></tr>
<tr><td>Independent work</td></tr>
<tr><td>90 a.h.</td></tr>
<tr><td>Form of examination</td></tr>
<tr><td>Credit</td></tr>
</table>

The ratio of hours of classes to independent work is: for full-time education – 0 / 90.

** Auditory load can be reduced or increased by one hour, depending on the schedule of classes.*

2. Goals and purposes of discipline

Goal: to provide an information and production base for the implementation of the bachelor's thesis project.

Task: to make the design and technological analysis of the set detail.

According to the requirements of the educational-professional program, students must achieve such **competencies:**

General competencies: *GC 1. Ability to communicate in the state language both orally and in writing. GC 5. Ability to work both independently and in a team with representatives of other professional groups. GC 6. Ability to generate new ideas (creativity). GC 7. Ability to make informed decisions in normal and special situations and implement them correctly. GC 8. Ability to learn and master modern knowledge. GC 9. The ability to exercise their rights and responsibilities as a member of society, to realize the values of civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms and Ukraine.*

Special (professional) competencies: *SC3. Ability to assign optimal materials for structural elements of aircraft and rocket and space technology. SC5. Ability to design and test elements of aerospace and rocketry, its equipment, systems and subsystems. SC6. Ability to develop and implement technological processes of production and maintenance of elements and objects of aviation and rocket and space technology. SC7. Skills in the use of information and communication technologies and specialized software in teaching and professional activities.*

Program learning outcomes: *PLO8. Comply with the requirements of industry regulations on the procedures for design, manufacture, testing, operation and (or) certification of elements and objects of aerospace and rocket technology at all stages of their life cycle.*

PLO10. Have the skills to determine the loads on the structural elements of aviation and space technology at all stages of its life cycle.

PLO12. Describe the structure of metals and nonmetals and know the methods of modifying their properties. Assign optimal materials for elements and systems of aerospace and rocket technology, taking into account their structure, physical, mechanical, chemical and operational properties, as well as economic factors.

PLO14. Describe experimental methods for studying the structural, physical-mechanical and technological properties of materials and structures.

PLO15. Apply in professional activities modern methods of design, construction and production of elements and systems of aviation and space technology.

PLO17. Understand and justify the sequence of design, manufacture, testing, operation and (or) certification of elements and systems of aerospace and rocketry.

PLO20. Understand the theoretical principles and practical methods of instrumental interchangeability of parts of aerospace and rocket technology.

PLO21. Have the skills to develop technological processes, including the use of automated computer-aided design of the production of structural elements and systems of aerospace and rocketry.

Prerequisites: Design and Strength of Aircraft Engines and Power Plants, Theory of Blade Machines, Theory of Air-breathing Engines, Engineering Mechanics, Mechanics of Materials and Constructions, Bases of Machine Designing, Material Science, Mathematics.

Requisites: Design, Strength and Dynamics of Aircraft Engines and Power Plants (TP), Engine manufacturing technology, Systems of Aircraft Power Plants, Components of Aircraft Power Plants Designing, Maintenance, Repair and Use of Aircraft Engines in Land Power Plants.

3. Course content

1. Study of rules and measures regarding safety equipment at the enterprise.
2. Acquaintance with the manufactured products.
3. Familiarity with the main technologies, including design, involved in the production process.
4. Familiarity with the software used at the enterprise.
5. Acquaintance with the main and auxiliary equipment and equipment of the enterprise.
6. Familiarity with the system of technical control of product quality.
7. Drawing up a report.

4. Control methods

6-th semester – *credit*.

5. Report requirements

The report must contain information about the identity of the student, the internship supervisors from the university and the company conducting the internship; place of practice. The report should briefly describe the company's history, structure, main technologies and adopted quality system; the opinion of practice managers regarding the qualities of the student-intern and the work performed by him. The report is checked and approved by the heads of practices from the base and educational institution. If the practice base is a university, the report is approved by the head of the university department.

6. Summary of practice

The results are summarized by the commission appointed by the head of the department during the student's assessment process. The differential grade from practice is taken into account along with other grades that characterize the student's success, the grade from this practice is taken into account together with the grades of the 7th semester.

Grade scales: national and ECTS

Grade scale	National scale	
	For exam, course project (work), practice	For test
90-100	"excellent"	Passed
75-89	"good"	
60-74	"satisfactory"	
0-59	"non-satisfactory"	Not passed

7. Criteria for evaluating the student's work during practice

Satisfactory (60-74). Have the necessary minimum knowledge and skills.

Know:

- safety rules in general for the enterprise and workplaces;
- nomenclature of manufactured products;
- technologies used in design, production preparation and production.

Good (75-89). In addition to the previous requirements: It is hard to master a minimum of knowledge and skills.

Know:

- software used at the enterprise;
- equipment and tools used in preparation for production and production.

Excellent (90-100). In addition to the previous requirements

know:

- basic devices and equipment used during technical control.

be able:

- describe the listed information in a concise form in the form of a report.

8. Methodological support

The main method of training during industrial practice is collective and individual classes in the services of the enterprise and independent training with the help of the listed sources and Internet resources.

9. Recommended literature

1. Open documentation of the enterprise.
2. Communication with responsible persons of the enterprise.