**COURSE DESCRIPTION**

**of the discipline**

“Theory of Aircraft Engines, Fuel and Lubricants”

**1. Educational program of the discipline**

*25.03.01 "Technical operation of aircraft and engines" is designed for bachelor's profile "Maintenance of aircraft* *and aircraft engines".*

**2. The total complexity** 5 credit units.

**3. The place of discipline in the structure of the educational program**

The discipline "theory of aircraft engines, fuel and lubricants" is a variable part of the block B1 "Mandatory disciplines" B1.V.OD.11

The discipline must be preceded by the following disciplines:

- Aircraft design;

- Physics;

- Thermodynamics and heat transfer;

- Aerodynamics;

- Aviation materials;

- Details of mechanisms and machines;

- Fundamentals of technical operation of aircraft and engines.

Students should know the theory of these subjects and be able to use this knowledge to study this discipline in order to get the most complete understanding of engines and their maintenance systems.

The discipline is necessary for high-quality completion of the diploma project, as well as for studying the following subjects:

- Flight dynamics;

- Certification of aviation equipment;

- Strength of aircraft structures;

- Production technology of aviation equipment;

- Aircraft design;

- Hydro-gas systems and life support systems;

- Construction of airframe units;

- Design features of passenger and cargo aircraft;

- Design features of seaplanes and amphibious aircraft;

- Design features of maneuverable aircraft;

- The basics repair of aircraft and aircraft engines;

- Efficiency of aviation complexes.

**4. The purpose of the discipline** is to study the types, theory, design and strength of aircraft engines, technical and operational characteristics of power plants as part of aircraft complexes, methods and criteria for selecting power plants for specific types of aircraft. students study the requirements for fuel and lubricants, their control before refueling.

**5. Requirements to results of development of discipline** the Process of discipline is aimed at formation of elements of the following competencies in accordance with GEF and OP HPE in this field of study:

- ability to manage (calculate) the required resources to ensure the process of maintaining the airworthiness of aircraft, including production facilities, personnel, equipment, tools

(PC-6)

- readiness for operation and maintenance of aircraft (PC-20);

**6. The content of the discipline**

Introduction. The composition of the power plant. Classification of aircraft engines. Piston aircraft engines. Rocket and air-jet engines. Turbine engine. Areas of application of aircraft engines. The parameters of the engine. Gasifier. Type of compressor. Combustion chamber. Turbine. Output device. Afterburner. Subsonic air intakes. Supersonic air intakes. Fuel system. Fuel-regulating equipment. Aviation fuels and their properties. The oil system. Aviation oil. Engine start systems. Engine noise and methods of dealing with it. Promising aviation power plants. Introduction. Requirements for the production of fuel and lubricants. Types of fuel. Purpose of additives. Regulatory framework for quality control of fuel and lubricants. Certification requirements for aviation fuel supply organizations. Certification requirements for organizations that perform quality control of fuel and lubricants. Requirements for receiving, storing, and issuing fuel for refueling. Safety measures when refueling an aircraft with fuel and lubricants. Responsibility of engineering and technical personnel.

**7. Basic educational technologies.**

1. Lectures.

2. Practical work.

3. Independent work of students.

**8. Forms of control**

As a current control, knowledge testing is provided by means of an oral survey and control works. As part of the discipline, intermediate certification (exam), intermediate certification (test)

Developed by .\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A.S. Boldyrev