# THERMODYNAMICS AND HEAT TRANSFER IN ENGINEERING

## COURSE SYLLABUS ABSTRACT

Specialty: 1– 36 07 02 – Production of products based on three-dimensional technologies

| | STUDY MODE | |
|---|---|---|
| | full-time | part-time |
| Year | 2 | 3 |
| Semester | 4 | 5 |
| Lectures, hours | 34 | 6 |
| Practical classes (seminars), hours | 16 | 4 |
| Laboratory classes, hours | 16 | 4 |
| In-class test (semester, hours) | - | 5 semester, (2 hours) |
| Exam, semester | 4 | 5 |
| Contact hours | 66 | 16 |
| Independent study, hours | 42 | 92 |
| Total course duration in hours / credit units | 108/3 | 108/3 |

1. Course outline

The discipline studies the issues of thermodynamics and heat transfer, which in turn form the professional level of a specialist, as well as the mechanisms and laws of heat transfer; methods of analysis of heat transfer processes, physical and mathematical modeling of heat transfer processes.

2. Course learning outcomes

Upon completion of the course, students will be expected to

know: mechanisms and laws of heat transfer; methods of analysis of heat transfer processes; the concept of complex heat transfer; elements of the theory of similarity and its application in the study of transfer processes; physical and mathematical modeling of heat transfer processes.

be able to: analyze the processes of heat and mass transfer in furnace units; be able to calculate the main parameters of heat transfer processes; use mathematical modeling methods to describe heat transfer processes; represent complex physical and chemical processes in the form of equations; to embody complex physical and chemical processes in a specific technological and instrumental design; competently choose the optimal technological modes of operation of the equipment and the most rational types of apparatus; effectively use reference literature, standards, specifications and reference materials.

own: methods for determining the physicochemical and thermophysical properties for the calculation of thermodynamic and heat transfer processes; the basics of designing heat exchange installations based on the laws of heat transfer; methods for selecting and calculating heat exchangers in accordance with the requirements for heat exchange equipment.

3. Competencies

SC 4. Have knowledge of theoretical and practical methods of obtaining, converting, transferring and using heat to select energy-saving heat engineering equipment and implement efficient modes of its operation.

4. Requirements and forms of midcourse evaluation and summative assessment

Defense of laboratory works is carried out orally. The exam is held in writing in the form of answers to test questions.