Code: 29 „Technical Thermodynamics and Heat Transfer”

ECTS credits: 5	Number of hours per week: 2+0+2
Forms of assessments: Exam	Types of assessment: Exam - written with oral discussion

Department, providing instruction on the discipline:

Department: *THERMAL ENGINEERING*
FACULTY OF SHIPBUILDING

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Annotation: The course "Technical Thermodynamics and Heat Transfer" is the theoretical discipline for students of the specialty "Marine Engineering". It is made up of two parts.

The first part - Technical thermodynamics studies the laws of energy transformations in the interaction of bodies and power fields and allows to determine the conditions for physical processes in the technical facilities. Students master the methods of exploring the most common macrophysical properties of material bodies that are showed in the processes of transformation of one kind of movement of matter into another.

In the second part - Heat transfer, attention is focused on the issues related to heat transfer through radiation, heat conduction and convection at stationary and non-stationary conditions of interaction. Consideration is also given to the intensification of heat exchang processes and heat exchangers.

The volume and the level of the course in this program are sufficient for the material to be mastered in a number of special disciplines. As a result of the study, the students should master not only the theory but also the methods for calculating the basic parameters of heat exchangers and equipment.

Main issues of the syllabus content:

- Technical Thermodynamics

Тема 1. Introductory concepts, definitions and laws of thermodynamics.
Тема 2. Evaluating properties using ideal gas model. Internally Reversible Steady - State Flow Processes.
Тема 3. Evaluating of thermodynamic processes of real gases and vapors. Vapor Power System.
Тема 4. Isentropic Flow Through Nozzles and Diffusers of Ideal Gases and Vapors. Throttling process.
Тема 5. Refrigeration and Heat Pump Systems.

- Heat transfer.

Тема 1. Heat Conduction;
Тема 2. Convection;
Тема 3. Radiation Heat Transfer;
Тема 4. Heat Transfer Intensification;

- Heat Exchangers.