

Course Syllabus

Academic year: 2018-2019

Institution	University of Petroșani
Faculty	Mechanical and Electrical Engineering
Field of study	Industrial engineering
Level	Bachelor
Program of study	Machine Building Technology

Course	Thermotechnics and thermal machines
Code	2BB3OD17
Year of study (semester)	II (III)
Number of hours	56
Number of credits	5
Professor	Professor eng.,Ph.D. PETRILEAN Dan Codruț

No.	Topic
1.	Functional principles of heat engines. Classification of Introduction. Fundamentals: thermodynamic system, thermodynamic parameters, thermodynamic equilibrium. Postulates of thermodynamics. Thermodynamic processes.
2.	Fundamental thermodynamic parameters. Perfect gas and real gas. Perfect gas equation of state. Perfect gas laws. Avogadro's Law. Expressing quantities of gas. Gas mixtures.
3.	Expression composition of a mixture. Transformations of shareholdings.
4.	Mechanical interaction systems. The work absolute, of flow and technology. Thermal interaction of the system. Specific heat. Classification and determination of specific heat.
5.	Internal energy. Enthalpy.
6.	The first law of thermodynamics. Mathematical expressions of the first principle.
7.	Change of state (isochoric, isobaric, isothermal, adiabatic, polytropic). The relative position of politropic the p-V diagram.

8.	Direct and reversed Carnot cycle. The second principle of thermodynamics. Graphical determination of the meaning of variation of temperature and heat exchange transformations.
9.	The Carnot. Integral of Clausius. Entropy. Perfect gas entropy change. Entropy in irreversible changes.
10.	T-s diagram and T-s diagram meanings in areas. Representation of politropic the T-s diagram. Graphical construction politropic the T-s diagram.
11.	Combustion. Triangle combustion. Calorific power, fuel analysis.
12.	Steam. Determination of steam parameters. p-V diagram.(Andrews) T-s diagram. Irreversible transformation of steam.
13.	The flow of gases and vapors. Gas flow equations. Gas and vapor flow through convergent and convergent nozzles - divergent. Ejector.
14.	Moist air. Parameters of moist air. I-x diagram (Mollier). Transformations moist air.
15.	Heat transfer. Heat transfer by conduction. Heat transfer by convection. Heat transfer by radiation. The overall heat exchange.
16.	Theoretical cycles of internal combustion engines. Spark ignition engines. Compression ignition engines with firing cycle. Gas turbines, steam turbines.
17.	Helical screw and displacement compressors