

Study program / course: Mechanical Engineering			
Type and level of study: Bachelor academic studies			
Course: Thermodynamics			
Lecturers: Bojić Lj. Milorad; Nebojša S. Lukić			
Status of course: Obligatory, joint for all modules, III semester			
Number of ECTS: 6			
Precondition: No			
The objective of course Educational objective of this course is to introduce students with mode and effects of heat transfer in thermodynamic devices and plants. These devices and plants serve for heating and air conditioning, as well as, for generation of work. The work is used to generate electrical energy and power mobile devices.			
The outcome of course Students are qualified to apply the obtained knowledge in further education as well as in as in practice with objective of sustainable use of energy and environment.			
Syllabus Theoretical study Thermodynamic system. Pressure, temperature, internal energy, work, and heat. Ideal gas. Equation of state, Specific heat capacity. Mixture of ideal gases. First law of Thermodynamics. Enthalpy. Technical work. Near-static and fast thermodynamic processes. Polytropic change of state of ideal gases. Second law of thermodynamics. Entropy and Thermodynamic temperature. Reversible and non-reversible change of State. Cannot- right hand side cycle with ideal gas. Exergy. Thermodynamic potential. Chemical potential. Real gas. Steam. Cycles of engines with pistons and gas turbines. Cycles of steam turbine plants. Cogeneration. Cycles of cooling plants and heat pumps. Heat transfer. Conduction. Convection. Conduction & Convection. Temperature radiation. Combustion.			
Practical classes Assignments from all theoretical fields, experiments (in laboratory), video clips, and expert systems on thermodynamics.			
Recommended reading 1. Bojic, M., Thermodynamics (in Serbian), Mechanical Engineering faculty at Kragujevac , 2008. 2. Voronjec, D., Djordjevic, R., Vasiljevic, B., Kozic, Dj., Bekavac, V., Solved problems of thermodynamics with Excerpts from Theory (in Serbian), VI edition, Mechanical Engineering faculty at Belgrade, 1990. 3. Kozic, Dj., Vasiljevic, B., Bekavac, V., Handbook for Thermodynamics (in Serbian), Mechanical Engineering faculty at Belgrade, 1989.			
The number of hours of active teaching:			Other classes: 1
Theory: 2	Practical classes: 2	Other forms of teaching: 0	
		Research study: 0	
Methods of teaching			
Evaluation of knowledge			
Pre-final exam obligations	points	Final exam	points
Activities during the classes:	5	Written exam	30
Activities during exercises:	5		
Colloquiums(s) :	45+15		
Seminar(s) :			