Faculty of Mechanical Engineering / MECHANICAL ENGINEERING / HEAT MACHINES

Course:	HEAT MACHINES			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
12199	Mandatory	1	6	2+2+0
Programs	MECHANICAL ENGINEERING			
Prerequisites	There are no special requirements for registering and listening to subjects			
Aims	Getting to know the basic terms, types and characteristics of heat engines. Acquiring basic knowledge of the physics of the working process in a heat engine. Analysis of operating parameters and operating characteristics of SUS engines and reciprocating compressors			
Learning outcomes	1. Unify theoretical knowledge from thermodynamics and fluid mechanics and apply them to a real object (engine SUS, reciprocating compressor), 2. Make simpler models and calculations of the actual cycle of the engine work process, as a starting point for engine design, 3. Master the working parameters and operating characteristics of the engine, 4. Assess the impact of the work process on the engines driving, energy and environmental characteristics .			
Lecturer / Teaching assistant	Prof.dr Radoje Vujadinović/MSc Marko Lučić			
Methodology	Lectures, calculation exercises, homework and consultations			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Basics of heat engines			
I week exercises	Basics of heat engines			
II week lectures	Ideal thermodynamic cycles of piston engines			
II week exercises	Ideal thermodynamic cycles of piston engines			
III week lectures	Ideal thermodynamic cycles of gas turbines			
III week exercises	Ideal thermodynamic cycles of gas turbines			
IV week lectures	Ideal thermodynamic cycles of supercharged engines			
IV week exercises	Ideal thermodynamic cycles of supercharged engines			
V week lectures	The actual cycles of the SUS engine			
V week exercises	The actual cycles of the SUS engine			
VI week lectures	Processes of changing working matter			
VI week exercises	Processes of changing working matter			
VII week lectures	Compression and expansion cycles and temperature at the end of the combustion process			
VII week exercises	Compression and expansion cycles and temperature at the end of the combustion process			
VIII week lectures	The first colloquium			
VIII week exercises	The first colloquium			
IX week lectures	Indicators for evaluating the work cycle, indicated and effective			
IX week exercises	Indicators for evaluating the work cycle, indicated and effective			
X week lectures	Engine heat balance			
X week exercises	Engine heat balance			
XI week lectures	Speed and regulation characteristics of the engine			
XI week exercises	Speed and regulation characteristics of the engine			
XII week lectures	Fundamentals of jet and propulsion engines			
XII week exercises	Fundamentals of jet and propulsion engines			
XIII week lectures	Basics of reciprocating compressors			
XIII week exercises	Basics of reciprocating compressors			
XIV week lectures	Indicators for evaluating the working cycle of reciprocating compressors			

XIV week exercises	Indicators for evaluating the working cycle of reciprocating compressors
XV week lectures	The second colloquium
XV week exercises	The second colloquium
Student workload	

Per week	**Per semester**
6 credits x 40/30=8 hours and 0 minuts 2 sat(a) theoretical classes 0 sat(a) practical classes 2 excercises **4 hour(s) i 0 minuts** of independent work, including consultations	Classes and final exam: **8 hour(s) i 0 minuts x 16 =128 hour(s) i 0 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **8 hour(s) i 0 minuts x 2 =16 hour(s) i 0 minuts** Total workload for the subject: **6 x 30=180 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **36 hour(s) i 0 minuts** Workload structure: **128 hour(s) i 0 minuts (cources), 16 hour(s) i 0 minuts (preparation), 36 hour(s) i 0 minuts (additional work)**
Student obligations	
Consultations	
Literature	[1] B. Nikolić: Toplotne mašine-skripta, Mašinski fakultet, Podgorica, 2001. [2] M. Tomić, S. Petrović: Motori SUS, Mašinski fakultet, Beograd, 2008. [3] M. Živković: Osnovi klipnih mašina, Mašinski fakultet, Beograd, 1984. [4] R. Jankov: Klipni kompresori, Mašinski fakultet, Beograd, 1990. [5] D. R. Radonjić, R. B. Pešić: Toplotni proračun motora SUS, Mašinski fakultet, Kragujevac, 1996. [6] Heywoodd J.B.: Internal Combustion Engine Fundamentals, McGraw-Hill, New York, 1988.
Examination methods	The total number of points for all activities is 100 points
Special remarks	
Comment	

Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points