

Subject card

Subject name and code	, PG_00056308								
Field of study	Ocean Engineering								
Date of commencement of studies	October 2021		Academic year of realisation of subject			2022/2023			
Education level	first-cycle studies		Subject group			Optional subject group Subject group related to scientific research in the field of study			
Mode of study	Full-time studies		Mode of delivery			at the university			
Year of study	2		Language of instruction			Polish			
Semester of study	4		ECTS credits			4.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Zakład Energetyki i Automatyki Morskiej -> Institute of Ocean Engineering and Ship Technology -> Factor of Mechanical Engineering and Ship Technology						y -> Faculty		
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marek Dzida						
	Teachers		dr hab. inż. M	larek Dzida					
			mgr inż. Jace	k Frost					
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	Number of study hours	30.0	15.0	15.0	0.0		0.0	60	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation in classes include plan				Self-study		SUM		
	Number of study hours	60		10.0		30.0		100	
Subject objectives	Provide knowledge of thermal rotor machines allows preliminary design cycle of gas and steam turbines, the combined cycles.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	[K6_U04] has self-education skills in order to improve professional qualifications, is ready to work in industrial environment, adheres to HSE rules and regulations		The student is able to find additional information in the field of rotating machinery			[SU4] Assessment of ability to use methods and tools			
			The student is able to formulate simple engineering problems and its specification in the range of rotor rotating machinery.			[SW1] Assessment of factual knowledge			
	[K6_W06] has an organized knowledge on engineering methods and design tools allowing the conducting of projects within the construction and operation of ocean technology objects and systems		The student has the knowledge of methods and tools applied for design of steam and gas turbine			[SW1] Assessment of factual knowledge			
	[K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems		The student is able to formulate simple engineering problems and its specification in the range of rotor rotating machinery.			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information			

Data wydruku: 10.04.2024 06:11 Strona 1 z 2

Subject contents	1. Cycles of steam turbine (Clausius-Rankine cycle, cycle with reheating, heat-regenerative feedwater, steam cycle of nuclear power plants, calculating thesteam cycle).2. Cycles of gas turbines (simple open cycle, open-cyclet complex (regenerative, intercooled, with the "reheat" in additional combustion chambers), closed cycle, calculation of gas turbine cycle).3. Steam and gas turbine combined cycle (with supplementary firing or without it).4. The theory of expansion nozzles (basic equations of motion of the gas, the calculation of nozzles and extension work in varying conditions nozzles, turbineprofile types, characteristics palisades vane and rotor - the geometric parameters and flow).5. Energy losses in flow through the palisade turbine (classification of losses, the impact of geometric parameters and motor losses on individual components, the selection of the main parameters of the palisade).6. Theory of axial stage (main flow equation for the stage, the efficiency of peripheral indicators of the stage, the characteristics of efficiency, selection of basic design parameters, the stage of Curtis; stages with long blades). 7. Another losses (friction loss of rotor blades, ventilation loss, leakage loss, the internal efficiency of turbine stage). 8. Multi-stage turbines (basic types of construction of turbines, turbine efficiency rating).						
Prerequisites and co-requisites	Thermodynamics						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	exercises	50.0%	30.0%				
	lab	60.0%	20.0%				
	lecture - final test	50.0%	50.0%				
Recommended reading	Basic literature Saweyer's Gas Turbine Engineering Handbook.Turbomachinery International Publications, USA, 1985 Saweyer's Turbomachinery Maintenance Handbook.Turbomachinery International Publications, USA, 1980						
	Supplementary literature	Saweyer's Gas Turbine Engineering Handbook.Turbomachinery International Publications, USA, 1985 Saweyer's Turbomachinery Maintenance Handbook.Turbomachinery International Publications, USA, 1980					
	eResources addresses	Adresy na platformie eNauczanie:					
		Okrętowe turbiny parowe i gazowe (PG 00056308) - Moodle ID: 28 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28102					
Example issues/ example questions/ tasks being completed							
Work placement	Not applicable						

Data wydruku: 10.04.2024 06:11 Strona 2 z 2