



Subject card

Subject name and code	Nuclear power plant systems, PG_00065883						
Field of study	Nuclear Engineering						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group		Obligatory subject group in the field of study 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	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Division of Thermal Power Systems -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology -> Wydziały Politechniki GdańskieJ						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Dariusz Mikielewicz				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		5.0		15.0	50
Subject objectives	The aim of the subject is to familiarise the student with auxialary equipment in the power plant						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W03] demonstrates structured and theory supported knowledge encompassing key issues in the field of Nuclear Power Technologies, enabling design of energy processes and systems		Knows the auxialary systems in the nuclear power plant and can characterise them		[SW1] Assessment of factual knowledge		
	[K7_U01] utilizes acquired analytical, simulation, and experimental methods, as well as mathematical models to analyse and evaluate processes occurring in nuclear power sector and related industries		Can specify operational parameters of particular elements of auxialary installation in the power plant		[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		
	[K7_W01] explains and describes, based on general knowledge in the field of scientific disciplines forming the theoretical foundations of Nuclear Power Technologies, the physics of processes, structure, principle of operation, operation, safety aspects, fuels and materials for reactors, systems, machines and devices of a nuclear power plant		Knows the principles of operation of auxialary systems in the nuclear power plant and can perform basic calculations related to them.		[SW1] Assessment of factual knowledge		

Subject contents	1. Introduction to auxialary systems in nuclear power plant		
	2. Nuclear island. Nuclear reactor and its operation		
	3. Reactor cooling system		
	4. Safety systems in nuclear reactor		
	5. Turbine island: Water circulation		
	6. Condenser cooling systems and their influence of power plant location		
	7. Lubrication, control and turbine safety systems		
	8. Emergency systems and emergency power supply		
	9. Modern designs of nuclear power plants and accompanying challenges		
Prerequisites and co-requisites	mathematics, physics, thermodynamics, heat transfer, fluid mechanics		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture	60.0%	60.0%
	Tutorials	60.0%	40.0%
Recommended reading	Basic literature	1. Pawlik M., Strzelczyk F., Elektrownie WNT 2023 2. Marecki J., Podstawy przemian energetycznych, WNT-2014 3. Kubowski J. Elektrownie Jądrowe WNT2013 4. Zieliński A. Elektrownie jądrowe w nowoczesnej gospodarce, PWN Warszawa, 2024 5. Portacha J. Układy cieplne elektrowni i elektrociepłowni konwencjonalnych, jądrowych i odnawialnych. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa-2016 6. Chmielniak T. Technologie energetyczne, PWN Warszawa 2021	
	Supplementary literature	1. Jezierski G. Energia jądrowa wczoraj i dziś, WNT 2005 2. Jeleń K. Energetyka jądrowa w Polsce, LEX Warszawa 2012 3. Dobrzyński L. (red.) Zarys nukleoniki, PWN, 2017 4. Radosław Szczerbowski, redakcja naukowa. Energetyka węglowa i jądrowa: wybrane aspekty, Poznań, 2017 5. Radosław Szczerbowski, Modelowanie układów technologicznych elektrowni jądrowych, Poznań	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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