

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Nuclear Power Plants, PG_00069139									
Field of study	Electrical Engineering, Automation, Robotics and Control Systems									
Date of commencement of studies	February 2025		Academic year of realisation of subject			2025/2026				
Education level	second-cycle studies		Subject group							
Mode of study	Full-time studies		Mode of delivery			at the university				
Year of study	1		Language of instruction			Polish				
Semester of study	2		ECTS credits			3.0				
Learning profile	general academic profile		Assessment form			assessment				
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering -> Wydziały Politechniki Gdańskiej									
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Marcin Jaskólski							
	Teachers									
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	ory Project		Seminar	SUM		
	Number of study hours	30.0	0.0	0.0 0.0			15.0	45		
	E-learning hours included: 0.0									
Learning activity and number of study hours	Learning activity	Participation ir classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM		
	Number of study hours	45		5.0		25.0		75		
Subject objectives	The aim of the course is for students to acquire knowledge related to key issues related to the construction, operation and importance of nuclear energy in the global energy economy.									
Learning outcomes	Course out	Subject outcome			Method of verification					
	[K7_W101] is able to make an in- depth identification of key objects and phenomena related to the field of study, as well as theories that describe them and applicable analytical and design methods		Knows the key technologies of generation III and IV nuclear reactors along with the phenomena describing them as well as methods for calculating their characteristic quantities.			[SW1] Assessment of factual knowledge				
	[K7_U02] is able to prepare and deliver a short oral presentation on a selected technical topic		Prepares a presentation of the task results and presents them orally.			[SU5] Assessment of ability to present the results of task				
	[K7_U03] is able to obtain information from literature, databases and other sources, also in English, draw conclusions, formulate and fully justify opinions. substantiate opinions; is able to identify directions for further learning and implement the process of self-education		Develops a solution to the task based on literature sources in Polish and English.			[SU1] Assessment of task fulfilment				
Subject contents	General problems and data of nuclear energy systems in the world. Classification of the world-wide existing different types of nuclear power stations and these stations which are foreseen for Poland. Elements of nuclear physics regarding especially light water reactors (LWR), thermal hydraulics of the primary circuit and of the power unit (secondary circuit) of nuclear power station. Basic technical and operation indices of the plant and means for improving the gross efficiency of the nuclear power plant. Operating conditions and performance characteristics of station equipment in particular bloc units with PWR reactors. Nuclear radiation shielding and radiation protection issues. Nuclear fuel cycle and the processing and handling of the radioactive wastes at nuclear power stations. EPR and AP1000 reactors - structure, technical data, safety systems. High-temperature reactors (SMR) - pros and cons. Selected SMR solutions. Modern nuclear fuel cycle. Nuclear fusion and fusion reactors.									
and co-requisites	mechanics, electrical engineering, thermodynamics, heat transfer). Knowledge of electrical energy generation technologies: energy conversions, efficiency of single conversion, efficiency of conversion cycle and thermodynamic cycle efficiency. Basic knowledge of mathematics: algebra, geometry, trigonometry, differential and integral calculus.									

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade			
	Seminar presentation	60.0%	33.0%			
	Lecture tests	60.0%	67.0%			
Recommended reading	Basic literature	Zieliński A. (red.): Elektrownie jądrowe w nowoczesnej gospodarce. Wydawnictwo Naukowe PWN, Warszawa 2024. Król K.: Bezpieczeństwo radiologiczne. Wydawnictwo Naukowe PWN, Warszawa 2024. Kubowski J.: Elektrownie jądrowe. Wydawnictwo Naukowe PWN, Warszawa 2017.				
	Supplementary literature	 Jezierski G.: Energia jądrowa wczoraj i dzisiaj. Warszawa: WNT 2005. 				
	eResources addresses					
Example issues/ example questions/ tasks being completed	 role and importance of nuclear energy in the global energy economy, classification of nuclear power plants, elements of nuclear physics regarding especially light water reactors (LWR), thermal hydraulics of the primary circuit and of the power unit (secondary circuit) of nuclear power plants, describe fuel cycle in nuclear reactors and management of radioactive waste. 					
Work placement	Not applicable					

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