



## Subject card

Subject name and code	, PG_00062023						
Field of study	Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024		
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	Zakład Maszyn Przepływowych -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marian Piwowarski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	0.0	45
	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	45		8.0		22.0	75
Subject objectives	The purpose of the course is to familiarize students with the construction of nuclear power plants and the technology of nuclear power generation.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W07] knows the environmental effects of energy technologies used; is familiar with the issues of effective energy management and use of renewable energy sources, has a broad and well-established knowledge of the processes of energy production and use		The student has basic knowledge related to the construction and operation of equipment of nuclear power plants.		[SW1] Assessment of factual knowledge		
	[K7_W06] knows the extended issues of reliability of power equipment and diagnostics of defects in this equipment		The student knows nuclear power plants with Generation II, III/III+ and IV reactors. He knows the environmental effects of current generation nuclear power plants.		[SW1] Assessment of factual knowledge		
	[K7_U05] is able to integrate technical and economic analysis of the use of various energy technologies, including technologies using renewable energy sources and conventional and nuclear energy		Students can describe and calculate the circuits of nuclear power plants and the processes occurring in thermal and fast nuclear reactors.		[SU1] Assessment of task fulfilment		
Subject contents	Nuclear Reactions. Historical outline of nuclear power. Nuclear energy in the world. Nuclear fuels and their properties. Classification of nuclear reactors. Construction of basic types of nuclear units. Efficiency of nuclear power plants. Nuclear fuel cycle. Safety systems used in nuclear power plants. Waste storage. The future of nuclear power.						
Prerequisites and co-requisites	Fundamentals of thermodynamics						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Kolokwium		50.0%		100.0%		

Recommended reading	Basic literature	<ul style="list-style-type: none"> <li>• Perycz S. Turbiny parowe elektrowni jądrowych, Wydawnictwo Politechniki Gdańskiej, Gdańsk 1986;</li> <li>• Celiński Z., Strupczewski A.: Podstawy energetyki jądrowej, WNT, Warszawa 1984.</li> <li>• Ackermann G. (red.): Eksploatacja elektrowni jądrowych, WNT, Warszawa 1987.</li> <li>• Kubowski J.: Nowoczesne elektrownie jądrowe, WNT, Warszawa 2010.</li> </ul>
	Supplementary literature	<ul style="list-style-type: none"> <li>• Kosowski K. et al.: Steam and gas turbines. Principles of operation and design. ALSTOM; Francja, Szwajcaria, Wielka Brytania, Polska 2007</li> <li>• Kiełkiewicz M.: Jądrowe reaktory energetyczne, WNT, Warszawa 1978.</li> <li>• Jeleń K., Rau Z.: Energetyka jądrowa w Polsce. Wolters Kluwer Polska Sp. z o.o., Warszawa 2012.</li> <li>• Jezierski G.: Energetyka jądrowa wczoraj i dziś. WNT, Warszawa 2005.</li> </ul>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Discuss the components of a nuclear power plant with a PWR reactor. Discuss a nuclear power plant with an SCWR reactor. Illustrate the temperature-entropy circuit of any nuclear power plant.	
Work placement	Not applicable	