



Subject card

Subject name and code	Nuclear Power Plants, PG_00042322						
Field of study	Electrical Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group					
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Jaskólski					
	Teachers	dr inż. Tomasz Minkiewicz					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	0.0	0.0	0.0	0.0	10
	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	10	6.0		34.0		50
Subject objectives	The purpose of the course is to provide general information about the construction, operation and significance of nuclear energy in the global energy economy.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_U03	Can synthesize information.			[SU2] Assessment of ability to analyse information		
	K7_W01	They can solve tasks in the field of nuclear block balancing.			[SW1] Assessment of factual knowledge		
	K7_W02	Knows selected measurement systems used in nuclear power.			[SW1] Assessment of factual knowledge		
	K7_U02	Can comment on a selected topic in the field of nuclear power plants.			[SU3] Assessment of ability to use knowledge gained from the subject		
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. Emergency reactor cooling systems and ventilation systems. Service water supply at nuclear power station. Importance of overall nuclear safety approach and safety of nuclear power plant.						
Prerequisites and co-requisites	Good knowledge of elements of physics (basic laws, physical quantities and their units and measures, 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		
	Lecture test	60.0%			100.0%		
Recommended reading	Basic literature	1. Kubowski J.: Nowoczesne elektrownie jądrowe. Warszawa: WNT 2010. 2. Celiński Z., Strupczewski A.: Podstawy energetyki jądrowej. Warszawa: WNT 1984. 3. Kielkiewicz M.: Jądrowe reaktory energetyczne. Warszawa: WNT 1978.					

	Supplementary literature	<ol style="list-style-type: none"> 1. Jeziński G.: Energia jądrowa wczoraj i dzisiaj. Warszawa: WNT 2005. 2. Żyszkowski W.: Wymiana ciepła w reaktorach jądrowych. Materiały szkoleniowe dla studiów podyplomowych. Gdańsk: Wydawnictwo Politechniki Gdańskiej 1991.
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>ELEKTROWNIE JĄDROWE [ET][II][Niestacjonarne][2023/24] - Moodle ID: 36124</p> <p>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36124</p>
Example issues/ example questions/ tasks being completed		<ul style="list-style-type: none"> • 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, • significance of nuclear safety and security of the entire nuclear energy.
Work placement		Not applicable