GDAŃSK UNIVERSITY OF TECHNOLOGY

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 lows, 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. Kiełkiewicz M.: Jądrowe reaktory energetyczne. Warszawa: WNT 1978.

	Supplementary literature	1. Jezierski 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	Adresy na platformie eNauczanie: ELEKTROWNIE JĄDROWE [ET][II][Niestacjonarne][2023/24] - Moodle ID: 36124 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36124
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, • significance of nuclear safety and security of the entire nuclear energy.	
Work placement	Not applicable	