GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Nuclear power plant systems, PG_00065883		
Field of study	Nuclear Engineering		
Date of commencement of studies	February 2027	Academic year of realisation of subject	2026/2027
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 -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Dariusz Mikielewicz	
	Teachers		

Lesson types

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_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
[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	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject
[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

<table>
<tr><td>Subject contents</td><td>Course content – lecture
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</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>mathematics, physics, thermodynamics, heat transfer, fluid mechanics</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Tutorials</td><td>60.0%</td><td>40.0%</td></tr>
<tr><td>Lecture</td><td>60.0%</td><td>60.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>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 Wydawnciza Politechniki Warszawskiej, Warszawa-2016
6. Chmielniak T. Technologie energetyczne, PWN Warszawa 2021</td></tr>
<tr><td>Supplementary literature</td><td>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</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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