GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Modern Sources of Electric Energy, PG_00038358						
Field of study	Electrical Engineering						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2026/2027			
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	1.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marcin Jaskólski					
	Teachers						

Lesson types

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	2.0	13.0	25

Subject objectives

The purpose of this course is to familiarize students with modern energy sources.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W03] has an extended and deepened knowledge of the field related to electrical power systems and electrical equipment	Describes the principle of operation of selected technologies for generating electricity.	[SW1] Assessment of factual knowledge
[K7_W08] has an extended knowledge of power supply systems power supply and control systems including the use of computer networks and design of these systems in industrial facilities industrial facilities	Performs a schematic presentation of the selected electricity generation system.	[SW1] Assessment of factual knowledge
[K7_U11] is able to analyse the variability of electricity loads, calculate power and energy losses, can carry out cost accounting	Calculates the values characteristic for selected power generation systems.	[SU1] Assessment of task fulfilment

Subject contents

Course content – lecture

Lecture: Different kinds of the sources especially the planed energy sources in Poland. Balancing principles of energy objects on the examples of: conventional steam power plants, especially the ultra supercritical plants and also these which are equiped with the hybrid systems with coal gasification and the boilers with fluidised bed combustion chamber and also with combined gas and steam blocks. Nuclear power stations with reactors of the latest generation. Some kinds of large and small combined heat and power energy sources. Calculations of technical and working coeffitients of above-mentioned sources. Importance of environmental protection problems.

Prerequisites and co-requisites

Good knowledge of elements of physics (basic lows, physical quantities and their units and measures, mechanics, electrical engineering, thermodinamics, heat transfer). Knowledge of electrical energy generation technologies: energy conversions, efficiency of single conversion, efficiency of conversion cycle and thermodinamic 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	Chmielniak T.: Technologie energetyczne. WNT, Warszawa 2021 Paska J.: Wytwarzanie energii elektrycznej. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2020 Marecki J.: Podstawy przemian energetycznych. WNT, Warszawa 2022 Pawlik M., Strzelczyk F.: Elektrownie. WNT, Warszawa 2017 Zieliński A. (red.): Elektrownie jądrowe w nowoczesnej gospodarce. Wydawnictwo Naukowe PWN, Warszawa 2024. Kubowski J.: Elektrownie jądrowe. Wydawnictwo Naukowe PWN, Warszawa 2017
	Supplementary literature	1. Praca zbiorowa: Poradnik inżyniera elektryka. Tom III. Warszawa: WNT 2007. 2. Cieśliński J., Mikielewicz J.: Niekonwencjonalne źródła energii. Gdańsk: Wydawnictwo Politechniki Gdańskiej 1996. 3. Szargut J., Ziębik A.: Podstawy energetyki cieplnej. Warszawa: Wydawnictwo Naukowe PWN 2000. 4. Lewandowski W.: Proekologiczne odnawialne źródła energii. Warszawa: WNT 2007.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Balancing principles of energy objects. 2. Describe last generation of nuclear power plants. 3. Describe importance of environmental protection problems.	
Practical activites within the subject	Not applicable	

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