GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Modern thermal power plants and hydrogen technologies, PG_00055911		
Field of study	Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Optional subject group 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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jerzy Głuch	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	15.0	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	2.0	18.0	50

Subject objectives

Familiarizing students with modern power plants in the power industry with particular emphasis on hydrogen technologies

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W12] has basic knowledge of the life cycle and repairs of energy equipment in the field of thermal power stations, thermal and energy systems and heating systems, internal combustion engines and compressors as well as rotating machines	student can solve the problem of the quality of operation of energy systems	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_W08] has basic knowledge in the field of intellectual property protection and patent law, knows and understands the basic processes of energy production and use, knows and understands the principles of modern heating and power systems	student can assess the energy system as an element of the economy	[SW1] Assessment of factual knowledge
[K6_U06] is able to use the basic knowledge on the operation of energy equipment in the field of thermal power plants, thermal and energy and heating systems, combustion engines, compressors and rotating machines to assess the technical condition of the system	student can formulate guidelines for the design of the energy system	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools

Subject contents

Drives in power plants. Propulsion in shipbuilding. Propulsion in aviation. Hybrid drives. Introduction to the design of power plant energy. Introduction to graph theory as applied to power plant energy assessment. Fluid mechanics in the design of drive engines. Designing energy-efficient ship power plants. Application of artificial intelligence methods in the assessment of the efficiency of drive power plants. Hydrogen technologies in hydrogen production and in the energy industry.

Prerequisites and co-requisites

basic knowledge in the field of thermodynamics and fluid dynamics

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	60.0%	100.0%

Recommended reading	Basic literature	1. Perycz S., Turbiny parowe i gazowe, Skrypt PG, Gdańsk 1988.2. Perycz S, Turbiny parowe i gazowe, Ossolineum, Gdańsk 1989.3. Traupel W., Thermische Turbomaschinen, Spriger-Verlag4. Szczeglaev A. W., Parovye turbiny, 5. Urbański P., Gospodarka energetyczna na statkach, Wyd.Morskie 19786. Kosowski K., Marine turbines, Wyd. PG Two volumens 7. Cichy M.: Modelowanie systemów energetycznych, Gdańsk: Wyd. Politechniki Gdańskiej 2001.8. Tuliszka E., Turbiny cieplne, WNT, Warszawa 1973.9. Miller A., Lewandowski J., Siłownie gazowo-parowe, WNT, Warszawa 1999.10. Starcew I. N., Truboprowody gazoturbinnych dwigatieliej,Maszinostrojenie, Moskwa 1973.11. Trojanowski B. M., Samojłowicz G. S., Parowyje i gazowyjeturbiny, Energoatomizdat, Moskwa 1989.12. Andrzejewski S., Podstawy projektowania siłowni cieplnych, WNT Warszawa 1975.13. Ziembik A., Gospodarka energetyczna, Skrypt Politechniki Śląskiej, Gliwice 1992.14. Czasopisma techniczne a zwłaszcza Transactions of ASME. Chmielniak T. Technologie wodorowe, WNT Warszawa 2020
	Supplementary literature	1. Janiczek R. S., Eksploatacja elektrowni parowych, WNT,Warszawa 1992.2. Orłowski Z., Diagnostyka w życiu turbin parowych, WNT,Warszawa 2001.3. Szuman W., Urządzenia pomocnicze elektrowni parowych,WNT, Warszawa 1962.4. Bunin W. I., Eksploatacja turbin parowych, WNT, Warszawa1956.5. Gundlach W. R., Maszyny przepływowe, T.1-3, PWN, Warszawa1971.6. Łączkowski R., Drgania elementów turbin cieplnych, WNT,Warszawa 1974.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Describe the role of hydrogen fuels in energetics	
Work placement	Not applicable	