GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Diagnostics and operation of energy devices , PG_00055915		
Field of study	Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2026/2027
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	4	Language of instruction	Polish none
Semester of study	7	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Fluid-Flow Machinery -> 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. Jerzy Głuch	
	Teachers	prof. dr hab. inż. Jerzy Głuch	

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15	1.0	9.0	25

Subject objectives	Rising students' knowledge with the principles of operation and methods for diagnosing the technical condition of power systems and power equipment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K04] is able to formulate opinions on technical and technological processes in energy and sanitary engineering	The student is able to identify thermal power plants and their operational models.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice
[K6_W06] knows classic and developmental energy technologies, rules for the selection and operation of heat and energy devices and installations, basic principles of energy systems operation, basic issues regarding the reliability of energy devices and diagnostics, environmental effects of energy technologies used, methods of using renewable energy sources	The student is able to find methods for evaluating the operational efficiency of power equipment.	[SW3] Assessment of knowledge contained in written work and projects
[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	The student is able to identify methods for planning overhauls based on equipment performance monitoring.	[SW1] Assessment of factual knowledge
[K6_W13] has basic knowledge of the operation of energy equipment in the field of thermal power plants, thermal and energy and heating systems, internal combustion engines, compressors and rotating machines, has basic knowledge of the regulation of energy equipment and methods of their selection depending on the needs	The student is able to determine the indicators of correct device operation for various loads.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture

Introduction, thermodynamic and mechanical measurements in industry, industrial measuring devices, distributed control systems (DCS), technical diagnostic methods, process diagnostic methods.

Prerequisites and co-requisites

Basic knowledge of thermal power plants, thermodynamics, fluid mechanics, and automatic control methods.

Assessment methods and criteria

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

Recommended reading

Basic literature

1. Augustyn J.: Inteligentne karty pomiarowe w szybkich systemach diagnostyki, Pomiary Automatyka Kontrola, nr 2/1999, s. 5-7.
2. Boczek F., Dyrda B.: Obliczenia eksploatacyjne PERFORMANCE CALCULATION, Energetyka nr 12/1996, s. 703-707.
3. Chmielniak T.: Miary oceny efektywności termodynamicznej siłowni cieplnych, W: (Materiały) II Konferencja PBEC95, Warszawa: Wyd. Politechniki Warszawskiej, Z. 6, 1995, s. 41-50.
4. Fodemski T. R., i inni: Pomiary cieplne. Cz. I i II, Warszawa: WNT 2001, 826 s.
5. Gładyś H., Matla R.: Praca elektrowni w systemie energetycznym, Warszawa: WNT 2004, 365 s.
6. Głuch J. redakcja i inni: Diagnostyczne relacje cieplno-przepływowe w ruchowych warunkach przemysłowych, Wydawnictwo Wydziału Oceanotechniki i Okrętownictwa PG, s.172.
7. Kościelny J. M.: Zdecentralizowane systemy automatyki (DCS) dla dużych instalacji technologicznych, Pomiary Automatyka Kontrola Nr 6/1998, s. 194.

Supplementary literature

1. PN: Polska Norma PR: PN-EN 60953-1: PR: PN-IEC953-1, PR: PNEN 60953-2: PR: PN-IEC953-2,. Wymagania dotyczące cieplnych badań odbiorczych turbin parowych. Arkusz 1 i 2: Metoda A i B, Grudzień 1998.
2. Zimmermann R.: Automatyczna centralizacja. Pomiary i obróbka danych, Warszawa: Wydawnictwo Ministerstwa Obrony Narodowej 1975, 369 s.
3. Żółtowski B., Ćwik Z.: Leksykon Diagnostyki Technicznej, Bydgoszcz: Wydawnictwo Uczelniane Akademii Techniczno-Rolniczej 1996, 486 s.

eResources addresses

Example issues/ example questions/ tasks being completed

Define tasks of DCS systems

Practical activites within the subject	Not applicable

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