



Subject card

Subject name and code	Contemporary directions of development in mechanical engineering, PG_00060401						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 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	2	Language of instruction				Polish	
Semester of study	3	ECTS credits				4.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	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						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	27.0	0.0	0.0	0.0	0.0	27
	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	27	0.0		0.0	27	
Subject objectives	Raising knowledge of students in modern directions of research and directions of development in the discipline Mechanical Engineering						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W81] has knowledge of complex grammatical structures and diverse lexical resources needed to communicate in foreign language in terms of general and specialist language related to field of study						
	[K7_U13] evaluates the feasibility and potential for utilizing new technical and technological achievements in accomplishing tasks characteristic for the field of study						
	[K7_U81] is able to communicate with ease in foreign language at B2+ level of the Common European Framework of Reference for Languages (CEFR) in everyday life, in academic and professional environments						
	[K7_K11] is aware of importance of professional acting, the need for critical verification of acquired knowledge and consulting experts opinion in case of facing difficulties with individual problem solving						
	[K7_K81] is able to cooperate in international team at her/his own university, during work placement and during study abroad						
Subject contents	Course content – lecture Introduction. The role of mechatronics. Hybrid drive. Application of artificial intelligence (AI) methods. New materials. Bionics. Future development paths.						

Prerequisites and co-requisites	Knowledge of mechanics, fluid mechanics and thermodynamics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	report in English	100.0%	100.0%

Recommended reading	Basic literature	<p>Bąkowski K.: Gas networks and installations PWN.</p> <p>Tesch K.: Fluid mechanics, Wyd. Gdańsk University of Technology, Gdańsk 2008</p> <p>Heynert H. General Bionics WNT Warsaw, 1975;</p> <p>Benyus J. Innovation inspired by nature. Biomimicry Perennial. New York; 2002;</p> <p>Morecki A. Bionic manipulators WNT Warsaw, 1976;</p> <p>Perycz S., Steam and gas turbines, Gdańsk University of Technology, Skrypt, Gdańsk 1988</p> <p>Kosowski K, Ship Turbine Power Plans, Wyd. PG Delft University, Gdańsk 2004</p> <p>Kosowski K, Introduction to the theory of marine turbines, Wyd. PG Delft University, Gdańsk 2004</p> <p>Allen Bursley Heat Engines Steam, Gas, Steam Turbines and their Auxiliaries</p> <p>Jakubik A., Non-mechanical damage of thermal equipment of power plants, WNT, Warsaw 1974.</p> <p>Gajewski T., Lesikiewicz A., Szymanik R., Przepływowe silniki odjetowe, WNT, Warszawa 1975.</p> <p>K. Gajewski, Turbine car drives, WNT, Warsaw 1978.</p> <p>Miller A., Lewandowski J., Gas-steam power plants, WNT, Warsaw 1999.</p> <p>Orłowski Z., Diagnostyka w życie turbin steamowych, WNT, Warszawa 2001.</p> <p>Walczyk Z., Kiciński J., Dynamics of power turbines, Wydawnictwo PG, Gdańsk 2001.</p> <p>Fletcher C.A.J. Computational Techniques for Fluid Dynamics</p> <p>Ferziger J.H, Peric M. Computational Methods for Fluid Dynamics</p> <p>Domachowski Z.: Automatic regulation of thermal turbine sets. Gdańsk University of Technology Publishing House, Gdańsk, 2011,</p> <p>Ziembik A., Energy economy, Silesian University of Technology Script, Gliwice 1992.</p> <p>Augustyn J.: Intelligent measurement cards in fast diagnostic systems, Pomiary Automatyka Kontrola, No. 2/1999, pp. 5-7.</p> <p>Boczek F., Dyrda B.: Operational calculations PERFORMANCE CALCULATION, Energetyka No. 12/1996, pp. 703-707.</p>
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	Supplementary literature	<p>Domachowski Z.: Automatic regulation of thermal turbine sets. Gdańsk University of Technology Publishing House, Gdańsk, 2011,</p> <p>Ziembik A., Energy economy, Silesian University of Technology Script, Gliwice 1992.</p> <p>Augustyn J.: Intelligent measurement cards in fast diagnostic systems, Pomiary Automatyka Kontrola, No. 2/1999, pp. 5-7.</p> <p>Boczek F., Dyrda B.: Operational calculations PERFORMANCE CALCULATION, Energetyka No. 12/1996, pp. 703-707.</p> <p>Bolikowski J.: Intelligent measurement transducers in the diagnostics of industrial processes, In: (Materials) II National Conference DPP97, Łagów, 8-11, September, 1997, pp. 37-42.</p> <p>Boroń W.: Characteristics of decentralized control systems, Pomiary Automatyka Kontrola nr 6/1998, pp. 203-206.</p>
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>Describe artificial intelligence methods in mechanical engineering</p> <p>Application of bionics in mechanical engineering</p>	
Practical activities within the subject	Not applicable	

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