GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Intermidiate CDIO Project, PG_00049760		
Field of study	Intermidiate CDIO Project		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
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	English
Semester of study	5	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Machine Design and Medical Engineering -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Stanisław Głuch	
	Teachers	dr inż. Stanisław Głuch	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	0.0	45.0	0.0	45

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	45	3.0	27.0	75

Subject objectives

Familiarization with the principles of design using the CDIO methodology, development of independent work skills, development of engineering skills

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U02] is able to apply the learned mathematical methods to the analysis and design of elements, systems and energy systems	is capable of applying CFD (Computational Fluid Dynamics) calculations in engineering design processes.	[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU4] Ocena umiejętności korzystania z metod i narzędzi
[K6_W09] knows the dangers of electrical devices and the principles of protection against them, has basic knowledge of heat exchangers, has basic knowledge of power equipment such as pumps, compressors, turbines, combustion engines, boilers, pipelines and their accessories and methods of their selection depending on the needs	The student acquires knowledge of the principles of power turbine design.	[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym
[K6_U11] Can design and properly dimension basic foundations in hydrotechnical construction facilities; can evaluate and list the loads acting on constructions, knows the codes of modern geotechnical investigations and technologies, knows the principles of foundations and safe design of foundations of typical buildings	is familiar with the design of a power turbine	[SU1] Ocena realizacji zadania [SU2] Ocena umiejętności analizy informacji [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU4] Ocena umiejętności korzystania z metod i narzędzi
[K6_W10] knows the basic installations in the field of renewable energy sources and their impact on the environment	is able to design a stage of a power turbine	[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym

Subject contents

Rankine cycle calculations. 0D stage calculations and design of a turbine. Drafting of the guide and rotor blade of the selected stage. Preparation of the computational mesh. Execution of CFD simulations.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Mechanical design and CAD skills development.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Project</td><td>56.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Kosowski, K., & Banaszkiewicz, M. (2007). Steam and gas turbines: principles of operation and design. ALSTOM. https://books.google.pl/books?id=fKGVtgAACAAJ</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Perycz, S. (1988). Steam and Gas Turbines (I). Wydawnictwo Politechniki Gdańskiej.</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Design and calculations of a turbine stage.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="3">Not applicable</td></tr>
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