GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Advanced CDIO Project, PG_00042082						
Field of study	Power Engineering, Power Engineering						
Date of commencement of studies	October 2022		Academic year of realisation of subject	2024/2025			
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	6		ECTS credits	4.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Piotr Mioduszewski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	30.0	0.0	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		5.0	65.0	100	
Subject objectives	Learning the skills necessary to design, build, test, implement, and operate real systems and products. Gaining technical knowledge, communication skills, teamwork, and problem-solving. Verification of theoretical and practical approaches in the design process.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	has the necessary knowledge of basic energy devices and energy conversion processes; is aware of the potential dangers and hazards resulting from the operation of energy devices	[SW1] Assessment of factual knowledge
[K6_U02] is able to apply the learned mathematical methods to the analysis and design of elements, systems and energy systems	is able to design elements of energy systems and circuits	[SU4] Assessment of ability to use methods and tools
[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 able to design and build functional models of basic energy systems and circuits	[SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task
[K6_U01] can obtain information from literature and other sources, organize, interpret it and draw and formulate conclusions; has the ability to self-educate, interprets the results of completed engineering tasks, is able to design simple energy systems and their systems	is able to independently obtain information from various sources necessary to solve the problems posed in the project	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
[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	knows the construction and principles of operation and maintenance of energy devices and systems; is aware of the need for their inspections, repairs and renovations over time	[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects

Subject contents

Design and production stages: adopting a team project plan, determining the necessary resources and how to obtain them. Designing in accordance with the principles of the design thinking process: empathy, defining the problem, generating ideas, building prototypes and testing. Evaluating designs and presentations.

Prerequisites and co-requisites

Knowledge of basic issues in the field of product modeling in CAD, machine manufacturing processes including mechanical processing technologies and 3D printing for their components, and information techniques.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Physical model of the energy system	50.0%	30.0%
Multimedia presentation	100.0%	70.0%

Recommended reading

Basic literature	Dietrich M.: Podstawy konstrukcji maszyn. Wydawnictwo Naukowo-Techniczne, Warszawa, 1999 Edward Crawley, Johan Malmqvist, Sören Östlund, Doris Brodeur: Rethinking Engineering Education, The CDIO Approach, 2007. Verganti Roberto: Design Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean, 2009. Tim Brown: Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation, 2009.
Supplementary literature	Chrościcki Zbigniew: Zarządzanie projektem zespołami zadaniowymi, Wyd. C.H. Beck, Warszawa 2001. Trocki Michał: Metodyki zarządzania projektami, Bizarre, Warszawa 2011.

	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Design and construction of a Rube Goldberg machine representing several energy conversion processes. Multimedia presentation describing the operation of individual elements and energy conversion processes.	
Work placement	Not applicable	

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