



Subject card

Subject name and code	Advanced CDIO Project, PG_00042082						
Field of study	Power Engineering, Power Engineering						
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	6	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Division of Mechanical Vehicles and Military Technology -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Piotr Mioduszewski					
	Teachers	dr hab. inż. Piotr Mioduszewski					
Lesson types	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_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_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
	[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_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	
Subject contents	Course content – project 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%	30.0%
	Teamwork	50.0%	40.0%
Recommended reading	<p>Basic literature</p> <p>Dietrich M.: Podstawy konstrukcji maszyn. Wydawnictwo NaukowoTechniczne, Warszawa, 1999</p> <p>Edward Crawley, Johan Malmqvist, Sören Östlund, Doris Brodeur: Rethinking Engineering Education, The CDIO Approach, 2007.</p> <p>Verganti Roberto: Design Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean, 2009.</p> <p>Tim Brown: Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation, 2009.</p>		

	Supplementary literature	Chrościcki Zbigniew: Zarządzanie projektem zespołami zadaniowymi, Wyd. C.H. Beck, Warszawa 2001. Trocki Michał: Metodyki zarządzania projektami, Bizarre, Warszawa 2011.
	eResources addresses	
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.	
Practical activities within the subject	Not applicable	

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