



## Subject card

Subject name and code	, PG_00043300						
Field of study	Coastal and Offshore Engineering, Coastal and Offshore Engineering						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group			Obligatory subject group in the field of study 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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Marine Mechatronics -> Faculty of Ocean Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Joanna Grzelak				
	Teachers		dr inż. Joanna Grzelak				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	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		15.0	50
Subject objectives	The aim of the course is to familiarize students with modern methods, objects and devices for obtaining energy in inland waters, as well as sea currents, waves and tides.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_W06		The student distinguishes types of hydrotechnical facilities and devices, assesses their suitability for specific water conditions, both inland and sea		[SW1] Assessment of factual knowledge		
	K7_U05		It determines and acquires the available necessary information to determine the type of facility and devices for the most efficient energy generation		[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	K7_U04		He is able to perform the necessary measurements of the existing water conditions to select the appropriate turbines and other power plant equipment and to estimate its power and efficiency.		[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		

Subject contents	<p>Lecture</p> <p>1. Introduction with the presentation of the thematic scope of lectures, literature and the method of passing. 2. Presentation of the type of land-based hydropower plants, their functions, principles of operation, type of turbines and other equipment and their impact on the natural environment. 3. Overview of the basic types of currently used water turbines, their construction, operation and regulation as well as the scope of effectiveness in specific water conditions of their operation. 4. Presentation of coastal, coastal and marine power plants for obtaining energy from tides, currents and sea waves, and their functions, principles of operation, types of turbines and other equipment and their impact on the natural environment.</p> <p>Exercise</p> <p>As part of the exercises, students will learn about the design of the drive and control of selected auxiliary devices of the power plant, including, for example, gate valves, grate cleaning devices, brakes and various other devices and mechanisms, determine their basic loads, which allows the selection of bearings, couplings, gear and engines.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	51.0%	100.0%
Recommended reading	Basic literature	<p>1. Krzyżanowski W.: Water turbines. Construction and principles of regulation. Scientific and Technical Publishing House. Warsaw, 1971.</p> <p>2. Łaski A.: Water power plants. Ed. Science and Technology, Warsaw, 1975</p> <p>3. Hoffmann M.: Small aquatic water. Nabba, Warsaw, 1991</p> <p>4. Chapallaz J. M.: Kleinwasserkraftwerke. Wasserturbinen. Impuls - with the PACER program. Bundesamt für Konjunkturfragen. 1995.</p> <p>5. Rduch J.: Selection of turbines for a small hydropower plant. IX Forum of Renewable Energy Sources. Zakopane 2003.</p>	
	Supplementary literature	<p>1. Dębiec J., Rduch J.: Laboratory tests of model turbines. Task 5.2. Research project no. 7 T07C 032 17 entitled Analysis of selected operational properties of cross-flow water turbines. Project Manager Zarzycki M. Gliwice 2001.</p> <p>2. Rduch J.: Selection of turbines for a small hydropower plant. IX Forum of Renewable Energy Sources. Zakopane 2003.</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		