



Subject card

Subject name and code	RENEWABLE ENERGY SOURCES - A TEAM PROJECT, PG_00061445						
Field of study	Engineering Management						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
Education level	first-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	Part-time studies (on-line)	Mode of delivery			blended-learning		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Informatics in Management -> Faculty of Management and Economics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Igor Garnik					
	Teachers	dr inż. Igor Garnik					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	16.0	0.0	0.0	16.0	0.0	32
	E-learning hours included: 24.0						
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	32	4.0		89.0		125
Subject objectives	The aim of the course is to familiarize students with the issues of renewable energy sources in the context of sustainable development. In the project, students will acquire the ability to assess the primary energy demand of buildings using various energy sources (conventional and unconventional) and determine the impact of the solutions used on the economic and environmental effects.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U03] demonstrates professional and effective teamwork, both as a leader and as a team member	designs concepts for effective use of renewable energy sources, for given assumptions, working as a team			[SU1] Assessment of task fulfilment		
	[K6_K02] makes competent and ethical decisions to create and maintain economic, social and environmental values	makes competent decisions taking into account economic, social and environmental values			[SK5] Assessment of ability to solve problems that arise in practice		
	[K6_W06] classifies the obtained information, evaluating its usefulness to solve the formulated problems	compares various sources of renewable energy, taking into account technical, economic and environmental aspects, assessing their suitability in a specific situation			[SW1] Assessment of factual knowledge		

Subject contents	<p>LECTURE</p> <p>Issues of energy production in Poland and in the world Problems of energy demand and storage Current legal conditions Renewable energy sources, types, characteristics Wind energy Water energy Solar energy Biomass energy Geothermal energy Nuclear energy Energy audit and its importance Passive construction and energy efficiency issues Economic calculation in the power industry Ecology and renewable energy sources Standardization, certification and sustainable development in the energy sector</p> <p>PROJECT</p> <p>Initial assumptions for the project, software characteristics Energy performance calculation methodology Characteristics of the building and the choice of calculation method Definition of external and internal partitions Analysis of the building's demand for thermal energy Analysis of energy demand for heating and ventilation Analysis of energy demand for heating domestic hot water Analysis of energy demand for cooling Analysis of energy demand for lighting Preparation of the building's energy performance certificate Ecological comparative analysis - stage I and II Economic comparative analysis stage I II Generating the final report</p>											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 871 794 898">Subject passing criteria</th> <th data-bbox="801 871 1139 898">Passing threshold</th> <th data-bbox="1145 871 1482 898">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 907 794 934">Project</td> <td data-bbox="801 907 1139 934">60.0%</td> <td data-bbox="1145 907 1482 934">60.0%</td> </tr> <tr> <td data-bbox="456 943 794 969">Test</td> <td data-bbox="801 943 1139 969">60.0%</td> <td data-bbox="1145 943 1482 969">40.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Project	60.0%	60.0%	Test	60.0%	40.0%
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Project	60.0%	60.0%										
Test	60.0%	40.0%										
Recommended reading	Basic literature	Ligus, M. (2022). Efektywność inwestycji w odnawialne źródła energii: analiza kosztów i korzyści. CeDeWu. Wydawnictwa Fachowe Dończyk, M., Korzon, M., Skibicki, O., & Stupak, M. (2022). Odnawialne źródła energii: poradnik dla inwestorów oraz wytwórców energii. Wolters Kluwer Lewandowski, W. (2006). Proekologiczne odnawialne źródła energii. Wydawnictwa Naukowo-Techniczne Kamrat W. (2022). Gospodarka energetyczna w warunkach rynkowych. Wydawnictwo Naukowe PWN										
	Supplementary literature	Trzcziński, M. (2013). Projektowanie budynku w technologii BIMstudium przypadku (Doctoral dissertation, Instytut Budownictwa) Gawin, D., & Sabinia, H. G. (Eds.). (2010). Świadectwa charakterystyki energetycznej: praktyczny poradnik. ArCADiasoft Chudzik Kwiatkowski, J., & Wiszniewski, A. (2022). Nowe funkcjonalności w systemie świadectw charakterystyki energetycznej budynków. Materiały Budowlane										
	eResources addresses	Adresy na platformie eNauczanie: Odnawialne źródła energii - st. niestacjonarne online 2023/2024 - Moodle ID: 35201 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35201										
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> Analyze the energy performance of the selected building. Propose several variants of modernization of an existing building to make it passive, taking into account the use of selected renewable energy sources. Determine which of the thermal modernization variants is the most beneficial in terms of the economic effect and which is the most beneficial in terms of the environmental effect. What renewable energy sources are the most beneficial to use in Poland. Justify your answer and provide examples of such installations in our country. 											
Work placement	Not applicable											