GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Converters in Renevable Power Engineering, PG_00042158		
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
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	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Controlled Electric Drives -> Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Marcin Morawiec	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	30.0	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	5.0	25.0	75

Subject objectives

The aim of the course is to discuss the basic structures of converter systems used in conjunction with renewable sources. Topics covered during the classes will include discussion of voltage and current converters, AC/DC and DC/AD converters, DC/DC converters, step-down and step-up voltage converters.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U04	The student is able to simulate and design a converter system connected to a selected renewable source.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
K6_W05	The student is able to define the types of renewable sources and has knowledge about the properties of power electronic converters.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation

Subject contents

1. Overview of basic renewable sources (solar systems, wind power plants, hydro power plants, biogas plants)2. Discussion of the basic characteristics of energy production in individual renewable sources3. Discussion of the structures of converter systems4. Discussion of the PLECS simulation program in the context of preparation for modeling5. Discussion of the methods of designing systems with renewable sources

Prerequisites and co-requisites

Basic knowledge of electrical circuits

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory	50.0%	75.0%
Lecture	50.0%	25.0%

Recommended reading	Basic literature	R. Tytko, Odnawialne źródła energii, OWG Technika B. Kołodziej, M. Matyka, Odnawialne źródła energii, Powszechne Wydawnictwo Rolnicze i Leśne, 2013 R. Barlik, M. Nowak, Poradnik inżyniera energoelektronika Tom 1, 2, Wydawnictwo Naukowe PWN, WNT 2023.
	Supplementary literature	-
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Overview of basic renewable sources2. Discussion of converter structures used with renewable sources3. Overview of control algorithms	
Work placement	Not applicable	