GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Guaranted Supply Systems, PG_00057703		
Field of study	Electrical Engineering		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Power Electronics and Electrical Machines -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jarosław Łuszcz	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	10.0	0.0	10.0	0.0	0.0	20

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	20	5.0	50.0	75

Subject objectives

Presentation of Power Quality problems and adequate improvement solutions.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U02] is able to prepare and deliver a short oral presentation on a selected technical topic	prepares a presentation on a selected topic related to power quality	[SU5] Assessment of ability to present the results of task
[K7_W06] has in-depth knowledge of industrial electronics, microprocessor control systems, programmable logic systems and printed circuit design and prototyping computer-aided prototyping	applies systematic knowledge in the field of power quality	[SW1] Assessment of factual knowledge
[K7_W02] has an in-depth and structured knowledge of electrical measurements electrical measurements, the methods and equipment used for electrical measurements of non-electrical quantities, he/she knows the principles of testing operation tests of electrical equipment, has a structured knowledge of electricity quality issues	applies systematic knowledge in the field of power quality	[SW1] Assessment of factual knowledge
[K7_U03] is able to obtain information from literature, databases and other sources, also in English, draw conclusions, formulate and fully justify opinions. substantiate opinions; is able to identify directions for further learning and implement the process of self-education	applies systematic knowledge in the field of power quality	[SU3] Assessment of ability to use knowledge gained from the subject

<table>
<tr><td>Subject contents</td><td>Course content – lecture
LECTURE
Power quality parameters related to power supply continuity.
Causes and effects of power supply discontinuity.
Uninterruptible power supply systems (UPS) - standardization requirements, classification.
Topologies used in uninterruptible power supply systems.
Generators.
Power supply systems with redundancy.
Batteries used in UPS systems.
Modern energy storage devices.

LABORATORY
Measurements of power quality parameters in the laboratory power supply network.
Testing of power quality parameters in power supply systems with an uninterruptible power supply during various operating modes.
Testing of dynamic parameters of the uninterruptible power supply.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Colloquium</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Test reports</td><td>50.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Iwan K., Musznicki P., Guziński J., Łuszcz J.Podstawy energoelektroniki. Laboratorium, Biblioteka Cyfrowa PG, ISBN 978-83-7348-398-9 , Rok wydania: 2011.
J. Wiatr, M. Orzechowski, M. Miegoń, A. Przasnyski, Poradnik projektanta systemów zasilania awaryjnego i gwarantowanego, EATON 2008.</td></tr>
<tr><td>Supplementary literature</td><td>J. Wiatr i B. Wiewiórowska-Paradowska, Zasilanie budynków użyteczności publicznej oraz budynków mieszkalnych w energię elektryczną: zasilacze UPS i baterie akumulatorów oraz metodyka ich doboru, układy pomiarowe zużytej energii. Warszawa: Grupa MEDIUM, 2024.
M. Świerżewski, Zasilanie awaryjne i bezprzerwowe urządzeń elektrycznych . Warszawa: Wiedza i Praktyka, 2021.

T. Sutkowski, Rezerwowe i bezprzerwowe zasilanie w energię elektryczną. Urządzenia i układy, COSiW SEP 2007.
J. Wiatr, M. Miegoń. Zasilacze UPS oraz baterie akumulatorów w układzie zasilania gwarantowanego. DW MEDIUM, 2008.
J. Wiatr, i in., Zespoły prądotwórcze i zasilacze UPS w układach zasilania budynków w energię elektryczną. Grupa MEDIUM, 2015.
PN-EN 62040-3 Systemy bezprzerwowego zasilania (UPS)
A. King, W. Knight. Uninterruptible Power Supplies. MCGRAW HILL BOOK CO, 2002.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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