GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| 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<br>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<br>[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<br>[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% |

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|---|---|---|
| Recommended reading | Basic literature | R. Tytko, Odnawialne źródła energii, OWG Technika<br><br>B. Kołodziej, M. Matyka, Odnawialne źródła energii, Powszechne Wydawnictwo Rolnicze i Leśne, 2013<br><br>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 | |