



Subject card

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|---|---|--|---|-------------------------------------|------------------------|------------|-----|
| Subject name and code | High-Voltage Technologies, PG_00038488 | | | | | | |
| Field of study | Electrical Engineering | | | | | | |
| Date of commencement of studies | February 2025 | | Academic year of realisation of subject | | 2025/2026 | | |
| Education level | second-cycle studies | | Subject group | | | | |
| Mode of study | Full-time studies | | Mode of delivery | | at the university | | |
| Year of study | 2 | | Language of instruction | | Polish | | |
| Semester of study | 3 | | ECTS credits | | 2.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| Conducting unit | Department Of Electrical Power Engineering -> Faculty Of Electrical And Control Engineering -> Wydział Politechniki Gdańskiej | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Marek Olesz | | | | |
| | Teachers | | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 15.0 | 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 educate specialists with knowledge in the field of innovative approaches to the analysis, construction and operation of high - voltage electrical, electromechanical, power and power electronic devices, as well as with the skills to conduct laboratory tests. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | [K7_W05] has detailed knowledge of the regulatory processes in the electricity system electricity system, electricity safety and electricity safety automation, is familiar with technologies high voltage | | | | | | |
| | [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 | | | | | | |

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| Subject contents | Lecture: | | |
| | 1. Carrying out live work. | | |
| | 2. Methods of locating damage to MV cable lines. | | |
| | 3. Exhaust gas treatment technologies | | |
| | 4. Comparative analysis of the possibilities of transmitting electricity using AC and DC current. | | |
| | 5. Technologies for the production of varistor surge arresters | | |
| | 6. Possible applications of superconducting cables in HV systems. The use of superconductors in high voltage technology. | | |
| | 7. Optimization of the operation of HV devices in testing and measurement technology and their electromagnetic compatibility in the zone of impact of strong electric discharges. | | |
| | Laboratory: | | |
| | Measurement and analysis of voltage distribution on insulators at alternating voltage. | | |
| Measurements of the variability of the electric field generated in the selected working space. | | | |
| Protective characteristics of surge arresters. | | | |
| Cable production technology - trip to TFK Bydgoszcz | | | |
| Technologies of live work - training ground in Straszyn | | | |
| Prerequisites and co-requisites | | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Laboratory | 60.0% | 50.0% |
| | Lecture | 60.0% | 50.0% |
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| Recommended reading | Basic literature | <p>1. Z. Flisowski: Technika wysokich napięć, WNT Warszawa 2017.</p> <p>2. Ciok Z.: Procesy łączeniowe w układach elektroenergetycznych, WNT Warszawa 1983.</p> <p>3. Ciok Z., Maksymiuk J., Pochanke Z., Zdanowicz L.: Badanie urządzeń energoelektrycznych, WNT, Warszawa 1992.</p> <p>4. Inżynieria wysokich napięć w elektroenergetyce, t.1 i t.2. Praca zbiorowa pod red. Hanny Mościckiej - Grzesiak. Wydawnictwo Politechniki Poznańskiej, Poznań, 1999.</p> <p>5. J. Maksymiuk, Z Pochanke: Obliczenia i badania diagnostyczne aparatury rozdzielczej, WNT Warszawa 2001.</p> <p>6. H. D. Stryczewska: Technologie plazmowe w energetyce i inżynierii środowiska, Wydawnictwo Politechniki Lubelskiej, Lublin 2009.</p> <p>7. A. Wiszniewski: Przekładniki w elektroenergetyce, WNT Warszawa 1992.</p> <p>8. Kamińska - Benmechernene A.: Wytwarzanie i modelowanie plazmy w plazmotronach łukowych, Wydawnictwo Politechniki Poznańskiej, Poznań, 1998.</p> |
| | Supplementary literature | <p>1. A. Haddad, D. Warne: Advances in high voltage engineering. Institution of Electrical Engineers 2004.</p> <p>2. Z. Kołaciński: Thermodynamics of short - arc plasma. PWN Warszawa 1989.</p> <p>3. Kuffel E., Zaengl W.S., Kuffel J.: High Voltage Fundamentals. Newnes 2005.</p> |
| | eResources addresses | Adresy na platformie eNauczanie: |
| Example issues/ example questions/ tasks being completed | <p>1. Discuss the course of example work under voltage in the power industry on MV lines</p> <p>2. Characterize any exhaust gas purification technology in industry</p> <p>3. What are the possibilities of increasing the current capacity of modern power lines?</p> <p>4. Discuss contemporary development trends in superconductors in the power industry.</p> <p>5. What is the electromagnetic compatibility of HV devices used in testing and measurement technology?</p> <p>6. The impact of surge arrester production technology on their current-voltage characteristics.</p> <p>7. Advantages and disadvantages of direct and alternating current energy distribution</p> | |
| Work placement | Not applicable | |

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