



Subject card

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| Subject name and code | Electric Power Systems, PG_00055898 | | | | | | |
| Field of study | Power Engineering | | | | | | |
| Date of commencement of studies | October 2024 | Academic year of realisation of subject | | | | 2026/2027 | |
| 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 | Full-time studies | Mode of delivery | | | | at the university | |
| Year of study | 3 | Language of instruction | | | | Polish | |
| Semester of study | 5 | ECTS credits | | | | 4.0 | |
| Learning profile | general academic profile | Assessment form | | | | assessment | |
| Conducting unit | Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr hab. inż. Jacek Klucznik | | | | | |
| | Teachers | | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 30.0 | 15.0 | 0.0 | 0.0 | 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 | | 6.0 | | 49.0 | 100 |
| Subject objectives | Knowledge about the transmission of electricity. Understanding the operation principles of the power system. Calculation of the of voltage levels, power losses, short-circuit currents. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | [K6_W05] has structured knowledge in the field of electrical engineering and electronics, necessary to understand the basics of operation and selection of electrical machines, electricity transmission systems and power electronic devices | | Student interprets equivalent circuits of line, transformer and generator. Student analyses radial and interconnected networks in normal conditions. Student analyses networks during faults. Student differences active and reactive power sources. | | [SW1] Assessment of factual knowledge | | |
| | [K6_W08] has basic knowledge in the field of intellectual property protection and patent law, knows and understands the basic processes of energy production and use, knows and understands the principles of modern heating and power systems | | The student performs the calculation of the initial short-circuit current, the power losses and voltage drops in the networks. | | [SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects | | |
| Subject contents | Power system structure. Devices for generation, transmission and distributon of electric energy. Generation of active and reactive power in power system. Sources of power and its characteristics. Electrical network - structure, parameters and purposes. HVDC systems. Equivalent circuits for power system elements. Power flow calculation in radial and interconnected networks. Short-circuits - reasons and effects. Balanced short-circuits calculation. | | | | | | |
| Prerequisites and co-requisites | Electric circuits theory | | | | | | |
| Assessment methods and criteria | Subject passing criteria | | Passing threshold | | Percentage of the final grade | | |
| | Midterm colloquium | | 50.0% | | 70.0% | | |
| | Final test | | 50.0% | | 30.0% | | |

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| Recommended reading | Basic literature | <p>Żmuda K.: Elektroenergetyczne układy przesyłowe i rozdzielcze. Wybrane zagadnienia z przykładami. Wydawnictwo Politechniki Śląskiej, Gliwice 2012.</p> <p>Kacejko P., Machowski J.: Zwarcia w sieciach elektroenergetycznych. WNT, Warszawa, 1993.</p> <p>Lubśny Z.: Zbiór zadań z obliczeń prądów zwarciovych w systemach elektroenergetycznych, skrypt PG.</p> <p>Irena Wasiak ELEKTROENERGETYKA W ZARYSIE Przesył i rozdział energii elektrycznej publikacja dostępna bezpłatnie w Internecie</p> |
| | Supplementary literature | IEEE Explore selected papers |
| | eResources addresses | Adresy na platformie eNauczenie: |
| Example issues/ example questions/ tasks being completed | <p>Calculate the value of the initial short-circuit current in the network of a given structure.</p> <p>Calculate the active power losses in the power line of given data parameters and load.</p> <p>Determine distribution of currents in the double-sided supplied network.</p> | |
| Work placement | Not applicable | |

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