



Subject card

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|---|--|--|---|-------------------------------------|--|------------|-----|
| Subject name and code | Electrical equipment and installations, PG_00059151 | | | | | | |
| Field of study | Environmental Engineering | | | | | | |
| Date of commencement of studies | October 2022 | | Academic year of realisation of subject | | 2022/2023 | | |
| Education level | first-cycle studies | | Subject group | | Obligatory subject group in the field of study | | |
| Mode of study | Full-time studies | | Mode of delivery | | at the university | | |
| Year of study | 1 | | Language of instruction | | Polish | | |
| Semester of study | 2 | | ECTS credits | | 2.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| Conducting unit | partment of Metrology and Information Systems -> Faculty of Electrical and Control Engineering | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr inż. Ariel Dzwonkowski | | | | |
| | Teachers | | dr inż. Ariel Dzwonkowski | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 15.0 | 0.0 | 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 | | 20.0 | 55 |
| Subject objectives | The aim of the course is to provide students with basic knowledge in the field of electrical devices and installations. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | [K6_W11] has elementary knowledge of electrical devices and installations as well as basics of control and automation | | The student defines and classifies the basic concepts of electrical engineering. The student solves simple DC and AC circuits. | | [SW1] Assessment of factual knowledge | | |
| | [K6_U01] has the ability to self-education, can obtain information from literature, databases and other sources, uses information technology, Internet resources; can integrate the obtained information, make their interpretation, as well as draw conclusions and formulate and justify opinions | | The student classifies and distinguishes DC and AC machines. The student defines the means of basic and additional protection against electric shock. | | [SU2] Assessment of ability to analyse information | | |
| Subject contents | Lectures: Basic concepts of theoretical electrical engineering. Direct and alternating current. Ohm's law. Conductor resistance. Kirchhoff's laws. Calculation of resultant resistance. Capacitors. Sinusoidal current. Power and energy in DC and AC circuits. Three-phase systems. Machines and electric drive. Types of electric machines. Transformers. No-load condition, loads and short circuits of the transformer. Types of electric machines. Direct current generators: separately excited, shunt and series-shunt. DC motors: separately excited and series. Alternating current synchronous generators. AC asynchronous motors. Nominal sizes of electrical machines. Regulation and stabilization of motor speed. Electrical Installations. Means of basic protection against electric shock. Additional shock protection. Reset. Earthings and earthings. RCDs. Exercises: DC and AC current. Ohm's law. Conductor resistance. Kirchhoff's laws. Calculation of resultant resistance. Capacitors. Sinusoidal current. Power in DC and AC circuits. | | | | | | |
| Prerequisites and co-requisites | Knowledge of operations with complex numbers. Basic knowledge of physics. | | | | | | |

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| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Exercises - written tests. | 60.0% | 50.0% |
| | Lecture - written tests. | 60.0% | 50.0% |
| Recommended reading | Basic literature | 1. Miedziński B.: Elektrotechnika. Podstawy i instalacje elektryczne. Warszawa: PWN 2000.2. Orlik W.: Egzamin kwalifikacyjny elektryka w pytaniach i odpowiedziach. Wydawnictwo KaBe 2006. | |
| | Supplementary literature | 1. S. Bolkowski Teoria obwodów elektrycznych, WNT 2007.2. M. Krakowski Elektrotechnika teoretyczna, PWN. | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
| Example issues/ example questions/ tasks being completed | 1. What is conductance?2. What is impedance?3. Introduce Ohm's law.4. Discuss the characteristics of a separately excited DC motor.5. Describe the construction of a ring motor.6. How does a residual current device work?7. Present the layout of the TT network.8. What is the additional protection against electric shock in LV networks? | | |
| Work placement | Not applicable | | |

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