



Subject card

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|---|--|--|---|-------------------------------------|--|--|---------|-----|
| Subject name and code | | Electronics and electrical engineering, PG_00061903 | | | | | | |
| Field of study | | Materials Engineering | | | | | | |
| Date of commencement of studies | | October 2025 | Academic year of realisation of subject | | | 2026/2027 | | |
| 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 | | 2 | Language of instruction | | | Polish | | |
| Semester of study | | 3 | ECTS credits | | | 5.0 | | |
| Learning profile | | general academic profile | Assessment form | | | assessment | | |
| Conducting unit | | Department Of Corrosion And Electrochemistry -> Faculty Of Chemistry -> Wydziały Politechniki Gdańskiej | | | | | | |
| Name and surname of lecturer (lecturers) | | Subject supervisor | | dr hab. inż. Krzysztof Żakowski | | | | |
| | | Teachers | | dr hab. inż. Krzysztof Żakowski | | | | |
| Lesson types and methods of instruction | | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | | Number of study hours | 30.0 | 0.0 | 30.0 | 0.0 | 0.0 | 60 |
| | | 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 | 60 | 5.0 | | 60.0 | 125 | |
| Subject objectives | | The student will master the basics of electrical engineering to the extent of understanding the generation, transmission and distribution of electricity and the principle of operation of selected electrical machines. The acquired knowledge will be useful in the further course of studies, in future professional work and in everyday life when using modern electrical and electronic devices. | | | | | | |
| Learning outcomes | | Course outcome | Subject outcome | | Method of verification | | | |
| | | [K6_U03] Can critically analyze and evaluate the functioning – particularly in the context of materials engineering –existing technical solutions, particularly equipment, objects, systems, processes. | The student is able to evaluate the functioning of basic electrical engineering equipment. | | [SU2] Assessment of ability to analyse information | | | |
| | | [K6_W05] Has the knowledge of mechanics, technology and electrical engineering, including engineering graphics and using computer aid, the use of databases in the design of technological processes. | The student knows the construction and application of basic electrical engineering equipment. | | [SW3] Assessment of knowledge contained in written work and projects | | | |
| | | [K6_K01] Understands the need to improve professional and personal competencies; is conscious of own limitations and knows when to turn to experts, properly establishes priorities helping to accomplish tasks defined by oneself or others. | The student understands the need to improve professional skills. | | [SK5] Assessment of ability to solve problems that arise in practice | | | |
| | | [K6_U01] Can properly use selected analytical, simulation and experimental methods, as well as devices for measuring the fundamental properties of materials and technological processes. | The student is able to measure electrical quantities. | | [SU4] Assessment of ability to use methods and tools | | | |

| Subject contents | <p>Lectures:</p> <ul style="list-style-type: none"> • Direct current electrical circuits • Alternating current electrical circuits • Three-phase systems, connection of consumers in star and delta • Electrical machines • Electric power system, generation, transmission and distribution of electricity • Electrical network systems and installations • Basic electronic components and circuits <p>Labs:</p> <ul style="list-style-type: none"> • Multimeters • Resistance measurements • Measurements of resistance to grounding • Diode and rectifiers • Operational amplifier • Prototype circuits • Residential electrical installations | | | | | | | | | | | |
|--|--|----------------------------------|--|--------------------------|-------------------|-------------------------------|------------|--------|-------|------------|-------|-------|
| Prerequisites and co-requisites | General electrical engineering knowledge. Fundamentals of physics. | | | | | | | | | | | |
| Assessment methods and criteria | <table border="1" data-bbox="448 792 1487 898"> <thead> <tr> <th data-bbox="448 792 794 831">Subject passing criteria</th> <th data-bbox="794 792 1141 831">Passing threshold</th> <th data-bbox="1141 792 1487 831">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 831 794 869">laboratory</td> <td data-bbox="794 831 1141 869">100.0%</td> <td data-bbox="1141 831 1487 869">50.0%</td> </tr> <tr> <td data-bbox="448 869 794 898">colloquium</td> <td data-bbox="794 869 1141 898">60.0%</td> <td data-bbox="1141 869 1487 898">50.0%</td> </tr> </tbody> </table> | | | Subject passing criteria | Passing threshold | Percentage of the final grade | laboratory | 100.0% | 50.0% | colloquium | 60.0% | 50.0% |
| Subject passing criteria | Passing threshold | Percentage of the final grade | | | | | | | | | | |
| laboratory | 100.0% | 50.0% | | | | | | | | | | |
| colloquium | 60.0% | 50.0% | | | | | | | | | | |
| Recommended reading | Basic literature | not applicable | | | | | | | | | | |
| | Supplementary literature | not applicable | | | | | | | | | | |
| | eResources addresses | Adresy na platformie eNauczanie: | | | | | | | | | | |
| Example issues/ example questions/ tasks being completed | <p>Lectures:</p> <ul style="list-style-type: none"> • Connection of three-phase consumers in star and delta. • Commutator machines. • Induction motors. • TN-S, TN-C-S network systems. • Diodes, transistors, thyristors. <p>Labs:</p> <ul style="list-style-type: none"> • Determination of the equivalent resistance of a circuit. • Determination of voltage-current characteristics of a diode. • Design and assembly of a prototype circuit with a temperature sensor. • Performing the design of an electrical system in an apartment. | | | | | | | | | | | |
| Work placement | Not applicable | | | | | | | | | | | |

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