

GDAŃSK UNIVERSITY

Subject card

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|---|---|--|---|--|---|--|---|--|
| October 2021 | 9 | Electrical Equipment, PG_00038445 Electrical Engineering | | | | | | |
| October 2021 | | Academic year of realisation of subject | | | 2023/2024 | | | |
| first-cycle studies | | Subject group | | | Obligatory subject group in the field of study Subject group related to scientific research in the field of study | | | |
| Full-time studies | | Mode of delivery | | | , | | | |
| 3 | | | | | Polish | | | |
| 5 | | | | | 3.0 | | | |
| general academic profile | | | | | exam | | | |
| - | | | | ontrol Engineering | | | | |
| | | | | | | | | |
| Teachers | | | | | | | | |
| | | | | | | | | |
| Lesson type | Lecture | Tutorial | Laboratory | Projec | t | Seminar | SUM | |
| Number of study hours | 15.0 | 0.0 | 15.0 | 0.0 | | 0.0 | 30 | |
| | | | i | | | | | |
| Learning activity | | | | | Self-study | | SUM | |
| Number of study hours | | | 6.0 | | 39.0 | | 75 | |
| Basic knowledge abo | out electric devi | ices | | | | | | |
| Course outcome Subject outcome Method of veri | | | | | erification | | | |
| K6_U09 | | Student calculates load currents and short-circuit currents and on the base of these calculations selects electrical circuit main elements. Interprets operation of electrical switches, current and voltage transducers and overvoltage protection devices. | | | [SU4] Assessment of ability to use methods and tools | | | |
| K6_W11 | | Student learns the basics of calculations related to the selection of electrical devices, taking into account the current principles of technical knowledge. | | [SW3] Assessment of knowledge contained in written work and projects | | | | |
| LECTURE Current-carrying capacity. Insulation loss-of-life evaluation. Life expectancy curve. Hot-spot temperature, temperature rise. Dynamic behaviour. Rapid heating, continuous heating, heating and cooling cycles. Sustained rating, short-time and cyclic ratings, short-circuit rating. Characteristics of short-circuit currents (scc). Far-from-generator and near-to-generator short-circuit. Initial symmetrical scc, peak scc, breaking scc, thermal equivalent scc. Short-circuit impedances of electrical equipment. Limitation of scc, reactors, current-limiting breaking devices. Selection of equipment according to scc. Electrical switches. Contact configurations, switching arc and quenching technique (vacuum, gas, air). Transient recovery voltage. Selection and operation. Cased switchboards. Fault arc and immunity to fault arc. Limiting of short- circuits effects. Operation. Current and voltage transducers. Current and voltage (inductive) measurement transformers, coreless transducers (capacitive and optical included). Components, equivalent diagrams, operation in normal and overcurrent conditions. Accuracy. Connection systems. Selection and operation. Overvoltage protection devices. Valve, expulsion and varistor arresters. Components, operation, selection principles. | | | | | | | | |
| | 5 general academic pride Department of Electric Subject supervisor Teachers Lesson type Number of study hours E-learning hours incl Learning activity Number of study hours Basic knowledge abor Course out K6_U09 K6_W11 LECTURE Current-C temperature, temper cycles. Sustained rat currents (scc). Far-fr breaking scc, thermar reactors, current-limi Contact configuration voltage. Selection ar circuits effects. Oper transformers, coreles operation in normal a Overvoltage protection principles. | 3 5 general academic profile Department of Electrical Power Eng Subject supervisor Teachers Lesson type Lecture Number of study 15.0 Participation i classes includ plan Number of study 30 bours 30 Basic knowledge about electric devided K6_U09 K6_U09 K6_W11 LECTURE Current-carrying capacitit temperature, temperature rise. Dyna cycles. Sustained rating, short-time currents (scc). Far-from-generator a breaking scc, thermal equivalent scoreactors, current-limiting breaking d Contact configurations, switching ar voltage. Selection and operation. Current a transformers, coreless transducers operation in normal and overcurrent Overvoltage protection devices. Val principles. LABORATORY Contacts in electric voltage fuses. Fault arc in cased sw | Full-time studies Mode of de 3 Language 5 ECTS cred general academic profile Assessmer Department of Electrical Power Engineering -> Fac Subject supervisor Teachers prof. dr hab. in dr inz. Daniel Lesson type Lesson type Lecture Tutorial Number of study 15.0 0.0 hours Participation in didactic classes included in study plan Number of study Number of study 30 30 Basic knowledge about electric devices Student calcu and short-circ the base of th selects electric elements. Inte elements. Inte elements. Inte electrical swit voltage transc overvoltage p K6_U09 Student calcu and short-circ the base of th selects electrical swit voltage transc overvoltage p K6_W11 Student learn calculations r selection of el taking into ac principles of th selects. Operature rise. Dynamic behaviour cycles. Sustained rating, short-time and cyclic ratin currents (scc). Far-from-generator and near-to-gen breaking devices. Selectic Contact configurations, switching arc and quenchir voltage. Selection of el taking into ac principles of th calculations r selection of el taking into ac principles of th calculations r selection and operation in normal and overcurrent conditions. Ac Overvoltage protection devices. Valve, expulsion a principles. LECTURE Corrent-carrying caseadiuge sw | Full-time studies Mode of delivery 3 Language of instructio 5 ECTS credits general academic profile Assessment form Department of Electrical Power Engineering -> Faculty of Electric Subject supervisor prof. dr hab. inz. Stanisław 0 Teachers prof. dr hab. inz. Stanisław 0 dr inz. Daniel Kowalak Lesson type Lesson type Lecture Tutorial Laboratory Number of study 15.0 nours On E-learning hours included: 0.0 E-learning activity Participation in didactic classes included in study plan Participation fonus Number of study hours 30 6.0 Basic knowledge about electric devices Course outcome Subject outcome K6_U09 Student calculates load curr and short-circuit currents an the base of these calculation selects electrical current and short-circuit currents an the base of these calculation selects electrical current avoltage transducers and overvoltage protection device K6_W11 Student learns the basics of calculations related to the selectrical devices themperature, temperature rise. Dynamic behaviour. Rapid heating cycles. Sustained rating, short-time and cyclic ratings, short-time and cyclic ratings. Short-circui timedances of reactors, current l | Full-time studies Mode of delivery 3 Language of instruction 5 ECTS credits general academic profile Assessment form Department of Electrical Power Engineering -> Faculty of Electrical and C Subject supervisor prof. dr hab. in2. Stanislaw Czapp Teachers prof. dr hab. in2. Stanislaw Czapp dr in2. Daniel Kowalak Lesson type Lesson type Lecture Number of study 15.0 nours 0.0 E-learning hours included: 0.0 Learning activity Participation in didactic classes included in study plan Number of study 30 nours 6.0 Basic knowledge about electric devices Course outcome Student calculates load currents and on the base of these calculations selects electrical circuit main elements. Interprets oparation of electrical switches, current and voltage transducers and on worvoltage protection devices. K6_W11 Student learns the basics of calculations selects electrical devices. K6_W11 Student learns the basics of calculations switching arc and quenching technical knowledge. LECTURE Current-carrying capacity. Insulation loss-of-life evaluation. Lif temperature, temperature rise. Dynamic behaviour. Rap | Full-time studies Mode of delivery at the 3 Language of instruction Polish 5 ECTS credits 3.0 general academic profile Assessment form exam Department of Electrical Power Engineering -> Faculty of Electrical and Control I Subject supervisor prof. dr hab. in2. Stanislaw Czapp Teachers prof. dr hab. in2. Stanislaw Czapp dr in2. Daniel Kowalak Lesson type Lecture Tutorial Laboratory Project Number of study 15.0 0.0 15.0 0.0 Pan Participation in didactic classes included in study plan Participation in didactic classes included in study plan Self-st Number of study 30 6.0 39.0 Basic knowledge about electric devices Course outcome Student calculates load currents and on the base of these calculations of electrical switches, current and voltage transducers and overvoltage protection devices. [SW4] K6_U09 Student learns the basics of calculations related to the current principles of technical knowledge. [SW4] LecTURE Current-carrying capacity. Insulation loss-of-life evaluation. Life expectements, current sing, short-ircuit, Intal symbreaking soc, thermal equivalent soc. Short-ircuit impedances of electrical equip irractors, current | Full-time studies Mode of delivery at the university 3 Language of instruction Polish 5 ECTS credits 3.0 general academic profile Assessment form exam Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering Subject supervisor prof. dr hab. inz. Stanislaw Czapp Teachers prof. dr hab. inz. Stanislaw Czapp dr inz. Daniel Kowalak Lesson type Lecture Tutorial Laboratory Project Seminar Number of study 15.0 0.0 15.0 0.0 0.0 Learning hours included: 0.0 Learning activity Participation in cloatcic classes included in study plan Self-study Number of study 30 6.0 39.0 39.0 Basic knowledge about electric devices K6_U09 Student calculates load currents and or chrout urrents and or voltage transducers and voltage transducers and voltage transducers and voltage protection devices. K6_W11 Student learns the basics of calculates electrical devices. [SW3] Assessment. Urrent and voltage individent calculates schroid or devices. K6_W11 Student learns the basics of calculators relat | |

| Prerequisites and co-requisites | No requirements | | | | | |
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| Assessment methods | Subject passing criteria | Passing threshold | Percentage of the final grade | | | |
| and criteria | Written exam | Vritten exam 50.0% | | | | |
| | Practical exercise | 100.0% | 33.0% | | | |
| Recommended reading | Basic literature | Kacejko P., Machowski J.: Zwarcia w systemach elektroenergetycznych. WNT, Warszawa 2013. Markiewicz H.: Urządzenia elektroenergetyczne. WNT, Warszawa 2016. Musiał E.: Instalacje i urządzenia elektroenergetyczne, WSP, Warszawa 2008. | | | | |
| | Supplementary literature | Maksymiuk J.: Aparaty elektryczne. WNT, Warszawa 1995. Wiszniewski A.: Przekładniki w elektroenergetyce. WNT, Warszawa 1992. | | | | |
| | eResources addresses | Adresy na platformie eNauczanie: URZĄDZENIA ELEKTRYCZNE [2023/24] - Moodle ID: 23797 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=23797 | | | | |
| Example issues/ example questions/ tasks being completed | Task: Calculate peak short-circuit current (i_p) for selection the switch in power system. | | | | | |
| Work placement | Not applicable | | | | | |