



Subject card

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|---|--|--|---|-------------------------------------|--|------------|-----|
| Subject name and code | Quality of Electric Energy (PQ I), PG_00036792 | | | | | | |
| Field of study | Electrical Engineering | | | | | | |
| Date of commencement of studies | October 2022 | | Academic year of realisation of subject | | 2024/2025 | | |
| Education level | first-cycle studies | | Subject group | | | | |
| Mode of study | Full-time studies | | Mode of delivery | | at the university | | |
| Year of study | 3 | | Language of instruction | | Polish | | |
| Semester of study | 6 | | ECTS credits | | 4.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| Conducting unit | Department of Power Electronics and Electrical Machines -> Faculty of Electrical and Control Engineering | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Jarosław Łuszcz | | | | |
| | Teachers | | | | | | |
| 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 | | 35.0 | 100 |
| Subject objectives | Presentation of the issues related to the quality of electricity in an industrial environment. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | K6_K05 | | He can organize work in accordance with the principles of safety rules. | | [SK3] Assessment of ability to organize work | | |
| | K6_K01 | | Knowledge of sources of specialist knowledge extending the scope of the course content. | | [SK5] Assessment of ability to solve problems that arise in practice | | |
| | K6_W10 | | The student knows the principles of processing, use and rational use of electrical energy | | [SW1] Assessment of factual knowledge | | |
| | K6_U09 | | The student is able to select power equipment for various load modes. | | [SU1] Assessment of task fulfilment | | |
| Subject contents | Power quality indices. Standardization requirements. Reasons for the degradation of energy quality. Sources of harmonic distortions. The effects of poor energy quality. | | | | | | |
| Prerequisites and co-requisites | | | | | | | |
| Assessment methods and criteria | Subject passing criteria | | Passing threshold | | Percentage of the final grade | | |
| | Task realisation | | 60.0% | | 100.0% | | |

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| Recommended reading | Basic literature | <ul style="list-style-type: none"> • Kowalski Z.: Jakość energii elektrycznej. Wyd. Politechniki Łódzkiej 2007. • Strzelecki R., Benysek G.: Power Electronics in Smart Electrical Energy Networks. Springer 2008. • Strzelecki R., Supronowicz H.: Współczynnik mocy w systemach zasilania prądu przemiennego i metody jego poprawy. Wyd. Politechniki Warszawskiej 2007. • A. Kempster: Elektromagnetyczne zaburzenia przewodzone w układach napędów przekształtnikowych. Oficyna Wydawnicza Uniwersytetu Zielonogórskiego 2005. • R. Smoleński: Conducted Electromagnetic Interference (EMI) in Smart Grids. Springer 2012. • Gregorio Romero Rey and Luisa Martinez Muneta (Ed.) Power Quality Harmonics Analysis and Real Measurements Data . , Croatia : InTech, 2011. • Ahmed Zobaa, Mario Manana Canteli and Ramesh Bansal: Power Quality Monitoring, Analysis and Enhancement. InTech 2011. |
| | Supplementary literature | <ol style="list-style-type: none"> 1. Baggini A.: Handbook of Power Quality. John Wiley & Sons 2008. 2. Benysek G.: Improvement in the Quality of Delivery of Electrical Energy using Power Electronics Systems. Springer 2007. 3. Hanzelka Z., Bień A.: Power quality application guide : harmonics, interharmonics. European Copper Institute, Brussels 2004. |
| | eResources addresses | Adresy na platformie eNauczanie: |
| Example issues/ example questions/ tasks being completed | Assessment of power quality compliance with the requirements of standards, | |
| Work placement | Not applicable | |

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