



Subject card

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|---|--|---|-------------------------------------|------------|---|---------|-----|
| Subject name and code | Physics II, PG_00059246 | | | | | | |
| Field of study | Civil Engineering | | | | | | |
| Date of commencement of studies | October 2023 | Academic year of realisation of subject | | | 2023/2024 | | |
| 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 | | | 3.0 | | |
| Learning profile | general academic profile | Assessment form | | | exam | | |
| Conducting unit | Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Tadeusz Miruszewski | | | | | |
| | Teachers | Joanna Pośpiech dr inż. Kamil Kolincio dr inż. Michał Winiarski dr hab. inż. Natalia Wójcik dr inż. Marta Prześniak-Welenc Piotr Okoczuk dr inż. Tadeusz Miruszewski | | | | | |
| 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 | 3.0 | | 42.0 | 75 | |
| Subject objectives | Familiarizing the student with the basic phenomena and laws of physics. Acquisition of skills by the student explaining phenomena, drawing conclusions and solving problems. | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | Method of verification | | |
| | [K6_U01] Apply knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering to solve engineering problems and issues. | The student defines the basic the law of physics. The student applies the acquired knowledge to describe physical reality and environmental. The student applies the laws of physics to identifying, formulating and solving problems | | | [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment | | |
| | [K6_W01] Demonstrate knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering at a level necessary to achieve the other programme outcomes. | The student solves the tasks accounting in physics and interprets obtained results | | | [SW1] Assessment of factual knowledge | | |

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| Subject contents | Electrostatics - point charges, field lines, field strength vector, principle of superposition of fields, potential energy of electrostatic interactions, field potential, motion of a particle in an electrostatic field, Gauss's law, conductors and dielectrics, capacitors, Cargo transport in conductors, Ohm's law, Kirchoff's laws, Magnetism: magnetic field - sources of magnetic field, Lorentz force, magnetic field induction vector, Ampere's law. Biot-Savart law, The phenomenon of electromagnetic induction - Faraday's law, alternating current, electromagnetic vibrations, Maxwell's laws, electromagnetic waves. Wave and geometric optics. | | |
| Prerequisites and co-requisites | Knowledge of mathematical analysis (differentiation and integration) Knowledge of vector algebra | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | passing both colloquia | 51.0% | 50.0% |
| | Physics exam pass | 51.0% | 50.0% |
| Recommended reading | Basic literature | Physics for universities -openstax Polska Fundamentals of physics - D.Halliday. R. Resnick, J. Walker | |
| | Supplementary literature | Collection of tasks in physics Jędrzejewski, Kruczek Collection of tasks in physics Irodov | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
| Example issues/ example questions/ tasks being completed | Based on Gauss's law, derive Coulomb's law Derive the formula for the magnetic field induction in the center of a circular conductor carrying current Prove the law of light reflection based on Fermat's principle | | |
| Work placement | Not applicable | | |

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