



Subject card

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|---|--|--|-------------------------------------|------------|---|---------|-----|
| Subject name and code | Physics, PG_00054677 | | | | | | |
| Field of study | Biotechnology | | | | | | |
| 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 | 1 | ECTS credits | | | 4.0 | | |
| Learning profile | general academic profile | Assessment form | | | assessment | | |
| Conducting unit | Zakład Spektroskopii Układów Złożonych -> Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr hab. inż. Waldemar Stampor | | | | | |
| | Teachers | dr hab. inż. Waldemar Stampor dr hab. Tomasz Wąsowicz dr inż. Marcin Dampc | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 30.0 | 15.0 | 0.0 | 0.0 | 0.0 | 45 |
| | 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 | 45 | 6.0 | | 49.0 | 100 | |
| Subject objectives | Student knows and describes natural phenomena. | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | Method of verification | | |
| | K6_U01 | Student learns by himself, can prepare experiments, has an ability to verify facts and to draw the conclusions | | | [SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools | | |
| | K6_W01 | Student knows fundamentals of classical mechanics, electricity and magnetism as well as geometric optics. | | | [SW1] Assessment of factual knowledge | | |

Subject contents

1. Units
2. Introduction to Kinematics, Vectors
3. Projectile Motion
4. Uniform Circular Motion
5. Newton's Laws of Motion
6. Frictional Force and Damping Force
7. Work and Energy
8. Simple Harmonic Motion
9. Damped Simple Harmonic Motion, Forced Oscillations and Resonance,
10. Momentum, Conservation of Linear of Momentum
11. Inelastic and Elastic Collisions
12. Rotation of Rigid Body, Angular Momentum, Conservation of Angular Momentum
13. Equilibrium
14. Sound Waves
15. Electric Field and Dipoles
16. Electric Flux and Gauss' Law
17. Electric Potential and Electric Potential Energy
18. Electrostatic Shielding, High-Voltage Breakdown, Capacitors
19. Polarization and Dielectrics
20. Electric Current, Resistance, Ohm's Law
21. Batteries and EMF
22. Magnetic Field and Lorentz Force
23. Moving Charge in B-field
24. Biot-Savart Law and Ampere's Law
25. Electromagnetic Induction

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| | <p>26. Magnetic Materials</p> <p>27. Wave Nature of Light</p> <p>28. Geometric Optics</p> | | |
| Prerequisites and co-requisites | | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | 2 tests during exercises | 50.0% | 35.0% |
| | Exam | 50.0% | 65.0% |
| Recommended reading | Basic literature | <p>D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, 8th Edition, Wiley 2008.</p> <p>•J. Jędrzejewski, W. Kruczek, A. Kujawski, Zbiór zadań z fizyki. Tom I i II dla uczniów szkół średnich i kandydatów na studia WT 2013</p> | |
| | Supplementary literature | <p>•P.G. Hewitt, Fizyka wokół nas, PWN 2016</p> <p>•K. Chyla, Zbiór prostych zadań z fizyki dla uczniów szkół średnich</p> | |
| | eResources addresses | <p>Adresy na platformie eNauczanie:</p> <p>Fizyka dla chemików 2023/2024 sem 1 - Moodle ID: 29523 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29523</p> | |
| Example issues/ example questions/ tasks being completed | <p>A body of mass 2.0 kg makes an elastic collision with another body at rest and continues to move in the original direction but with one-fourth of its original speed. (a) What is the mass of the other body? (b) What is the speed of the two-body center of mass if the initial speed of the 2.0 kg body was 4.0 m/s?</p> | | |
| Work placement | Not applicable | | |