



Subject card

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| Subject name and code | Mathematical methods of physics , PG_00027637 | | | | | | |
| Field of study | Mathematics | | | | | | |
| Date of commencement of studies | October 2023 | | Academic year of realisation of subject | | 2025/2026 | | |
| Education level | first-cycle studies | | Subject group | | Optional subject group Subject group related to scientific research in the field of study | | |
| 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 | | exam | | |
| Conducting unit | Department of Probability Theory and Biomathematics -> Faculty of Applied Physics and Mathematics | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr inż. Paweł Wojda | | | | |
| | Teachers | | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 30.0 | 30.0 | 0.0 | 0.0 | 0.0 | 60 |
| | E-learning hours included: 0.0 | | | | | | |
| | Adresy na platformie eNauczanie: | | | | | | |
| 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 | To familiarize the student with with the mathematical methods used in physics | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | K6_K01 | | knows the limits of his own knowledge and understands the need for further education | | [SK2] Assessment of progress of work | | |
| | K6_U05 | | Student applies theorems and methods of differential calculus of functions of one and several variables | | [SU4] Assessment of ability to use methods and tools | | |
| | K6_W03 | | Student understands the construction of mathematical theories, mathematical formalism can be used to construct and analyze simple mathematical models in other sciences | | [SW2] Assessment of knowledge contained in presentation | | |
| | K6_U08 | | Student knows how to calculate determinants and knows their property; can give a geometric interpretation of the determinant and understands its relationship with the mathematical analysis | | [SU1] Assessment of task fulfilment | | |
| | K6_K02 | | Students understand the need to popularize the application of differential equations in fields such as physics. | | [SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice | | |
| Subject contents | 1. Calculation of selected integrals useful in physics. 2. Mathematical description of physical phenomena: mathematical pendulum, free vibrations and suppressed harmonic oscillator, motion of a material point. 3. Fourier transform and Fourier series. 4. Formulating the initial-boundary problems of mathematical physics: mass diffusion, electric current conduction, wave phenomena. 5. Elements of tensor calculus. | | | | | | |

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| Prerequisites and co-requisites | Differential equations I Partial differential equations | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | exam | 50.0% | 40.0% |
| | tests | 50.0% | 60.0% |
| Recommended reading | Basic literature | 1. J. Rybicki: Metody matematyczne fizyki, Politechnika Gdańska, 1987. 2. A. Zagórski: Metody matematyczne fizyki, Oficyna Wydawnicza Politechniki Warszawskiej, 2014. 3. A.N.Tichonow, A.A.Samarski: Równania fizyki matematycznej, PWN 1963. | |
| | Supplementary literature | 1. F.W. Byron, R.W. Fuller: Matematyka w fizyce klasycznej i kwantowej. PWN,1975. 2. W.A. Majewski: Metody Matematyczne Fizyki I. skrypt Uniwersytet Gdański, 1990. 3. E. Karaśkiewicz: Zarys teorii wektorów i tensorów. PWN, 1964. | |
| | eResources addresses | | |
| Example issues/ example questions/ tasks being completed | What are the free vibrations of the harmonic oscillator? | | |
| Work placement | Not applicable | | |