## Subject card

| Subject name and code | Linear Algebra, PG_00021032 |  |  |  |  |  |  |
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| Field of study | Mathematics |  |  |  |  |  |  |
| Date of commencement of studies | October 2021 |  | Academic year of realisation of subject |  |  | 2021/2022 |  |
| Education level | first-cycle studies |  | Subject group |  |  | Obligatory subject group in the field of study <br> 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 | 1 |  | Language of instruction |  |  | Polish |  |
| Semester of study | 2 |  | ECTS credits |  |  | 5.0 |  |
| Learning profile | general academic profile |  | Assessment form |  |  | exam |  |
| Conducting unit | Department of Nonlinear Analysis and Statistics -> Faculty of Applied Physics and Mathematics |  |  |  |  |  |  |
| Name and surname of lecturer (lecturers) | Subject supervisor |  | dr hab. Zdzisław Dzedzej |  |  |  |  |
|  | Teachers |  | dr inż. Anita Zgorzelska dr hab. Zdzisław Dzedzej mgr inż. Tomasz Gzella |  |  |  |  |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Projec | 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: <br> Algebra liniowa 2/ 2022 - Moodle ID: 21768 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21768 |  |  |  |  |  |  |
| 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 |  | 60.0 | 125 |
| Subject objectives | Learning of Elements of linear algebra |  |  |  |  |  |  |
| Learning outcomes | Course outcome |  | Subject outcome |  |  | Method of verification |  |
|  | K6_W07 |  | linear properties in calculus and other parts of mathematics |  |  | [SW1] Assessment of factual knowledge |  |
|  | K6_W02 |  | formulates and proves basic theorems |  |  | [SW1] Assessment of factual knowledge |  |
|  | K6_U08 |  | complex numbers, determinants, matrices, eigenvalues |  |  | [SU4] Assessment of ability to use methods and tools |  |
|  | K6_U03 |  | proper use of algebraic objects |  |  | [SU3] Assessment of ability to use knowledge gained from the subject |  |
|  | K6_U01 |  | proving simple properties of matrices, linear independence or orthogonality of vectors |  |  | [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools |  |


| Subject contents | linear maps, kernel, image; matrix of a linear map, change of bases; |  |
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|  | scalar multiplication, unitary spaces; orthogonal bases, ortogonalisation of Gram-Schmidt; |  |
|  | orthogonal matrices, symmetric matrices; |  |
|  | eigenvalues and eigenvectors; |  |
|  | diagonalisation; |  |
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