



Subject card

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|---|--|---|-------------------------------------|------------|--|---------|-----|
| Subject name and code | Linear Algebra, PG_00047356 | | | | | | |
| Field of study | Biomedical 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 | 1 | ECTS credits | | | 3.0 | | |
| Learning profile | general academic profile | Assessment form | | | assessment | | |
| Conducting unit | Mathematics Center -> Vice-Rector for Education | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr Barbara Wikeł | | | | | |
| | Teachers | mgr inż. Wojciech Dąbrowski dr Barbara Wikeł | | | | | |
| 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 | Students obtain competence in the range of using methods of linear algebra and knowledge how to solve simple problems that can be found in the field of engineering. | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | Method of verification | | |
| | [K6_K02] is ready to critically assess possessed knowledge and acknowledge the importance of knowledge in solving cognitive and practical problems | Student recognizes the importance of skillful use of basic mathematical apparatus in terms of study in the future. | | | [SK4] Assessment of communication skills, including language correctness | | |
| | [K6_W01] Knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study | Student defines the basic concepts of linear algebra and analitic geometry necessary to solve simple engineering problems in the domain of education. | | | [SW1] Assessment of factual knowledge | | |
| | [K6_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study and perform tasks, in an innovative way, in not entirely predictable conditions, by:n- appropriate selection of sources and information obtained from them, assessment, critical analysis and synthesis of this information,n- selection and application of appropriate methods and toolsn | Student uses basic notions and formulas of matrix and vector calculus. Student analyses a given problem from analitic geometry. Student uses complex numbers. | | | [SU4] Assessment of ability to use methods and tools | | |
| Subject contents | Calculus of vectors. Basis vectors. Matrices. Calculus of matrixes. Determinants and their properties. Inverse matrix. Rank of a matrix. Eigenvalues and eigenvectors of a square matrix. Systems of linear equations. Line and plane in space. Complex numbers. Operations on complex numbers. | | | | | | |
| Prerequisites and co-requisites | | | | | | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | | | Percentage of the final grade | | |
| | Final test | 58.0% | | | 100.0% | | |

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| Recommended reading | Basic literature | <p>1. Długosz J., „Funkcje zespolone. Teoria, przykłady, zadania, Oficyna Wydawnicza GiS</p> <p>2. Jurlewicz T., Skoczylas Z., Algebra i geometria analityczna. Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS</p> <p>3. Jurlewicz T., Skoczylas Z., Algebra i geometria analityczna. Przykłady i zadania, Oficyna Wydawnicza GiS</p> <p>4. Jurlewicz T., Skoczylas Z., Algebra i geometria analityczna. Kolokwia i egzaminy, Oficyna Wydawnicza GiS</p> |
| | Supplementary literature | <p>1. Jankowska K., Jankowski T., Zbiór zadań z matematyki, Wydawnictwo Politechniki Gdańskiej</p> <p>2. Kajetanowicz P., Wierzejewski J., „Algebra z geometrią analityczną”, Wydawnictwo Naukowe PWN</p> |
| | eResources addresses | Adresy na platformie eNauczanie: |
| Example issues/ example questions/ tasks being completed | <p>1. Solve the matrix equation $AX=B$, where A and B are given matrices.</p> <p>2. Using the Cramer formula find the unknown x from the system of equations: $2x+y+3z+2t=3$, $3x+z=1$, $5y-2x+z=1$, $-5x+4y+2z=1$.</p> <p>3. Find the roots of the equation $z^4 +16i=0$. Give their algebraic form.</p> <p>4. Find the general equation of the plane passing through the point $A(-1,2,4)$ and perpendicular to the line $2(x-1)=y+2=-3z$.</p> | |
| Work placement | Not applicable | |