COURSE DESCRIPTION CARD - SYLLABUS

Course name
Selected issues in mathematics [N1Trans1>WZM]

Course

Field of study
Transport

Year/Semester
1/2

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
18

Laboratory classes
0

Other (e.g. online)
0

Tutorials
9

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

1. Knowledge of algebra and geometry, differential calculus and integral calculus of functions of one variable in the scope of the 1st semester of study. 2. Logical thinking, learning with understanding, the use of textbooks. 3. Willingness to acquire new knowledge and the need for systematic self-education.

Course objective

1. Getting to Know the issues of algebra and geometry and the possibility of their application in subjects directional.

Course-related learning outcomes

Knowledge:
The student has an extended and deepened knowledge of mathematics useful for formulating and solving complex technical tasks concerning various means of transport
The student knows the basic techniques, methods and tools used in the process of solving tasks in the field of transport, mainly of an engineering nature engineering

Skills:

The student is able, when formulating and solving tasks in the field of transport, to apply appropriately selected methods, including analytical, simulation or experimental methods

Social competences:
The student is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning transport systems that have led to serious financial and social losses or to serious loss of health and even life

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture:
Assessment on the basis of a written exam conducted during the exam session at the end of the semester. The assessment also takes into account the student"s activity during classes.
Tutorials:
Assessment on the basis of 2 tests and activity in the classroom.

Programme content

Update 2024/2025
Complex numbers.
Matrices and determinants.
Systems of linear equations.
Vectors in three-dimensional space.
Analytical geometry in space.

Course topics

Update 2024/2025
Complex numbers (algebraic, trigonometric, exponential, action, Moivre"s formula, Euler"s patterns, polynomials). Matrices and determinants (actions, properties, Laplace theorem). Systems of linear equations (Cramer"s theorem, Kronecker-Capelli theorem). Geometry in three-dimensional space (actions on vectors and their properties, a straight line and a plane in space).
Analytical geometry in space; equation of plane and line, mutual position of line and plane. Equations of solids in space; cylinder, paraboloid, hyperboloid, cone, sphere.

Teaching methods

Lecture:
At the lecture, the theory is supported by examples. The lecture is conducted in an interactive way with formulating questions towards students. Completed with self-solve tasks, which are verified and have an impact on the final grade.
Tutorials:
The exercises include an example of solving tasks on the blackboard (by the teacher and students) along with the analysis of subsequent stages. The way students solve the problem on the blackboard is reviewed by the tutor.

Bibliography

Basic
1. H. Jurlewicz, Z. Skoczylas, Algebra liniowa 1, Oficyna Wydawnicza GiS, Wrocław 2006.
2. I. Foltyńska, Z. Ratajczak, Z. Szafrański, Matematyka cz. I, II,III, Wydawnictwo Politechniki Poznańskiej, Poznań 2001.
Additional
1. Dennis G. Zill, Calculus with Analytic Geometry, Prindle,Weber & Schmidt, Boston 1985.

Breakdown of average student's workload

	Hours	ECTS
Total workload	70	3,00
Classes requiring direct contact with the teacher	27	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	43	2,00