



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Mathematics [S1IZarz1E>MAT1]

Course

Field of study

Engineering Management

Year/Semester

1/1

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

English

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

0

Other (e.g. online)

0

Tutorials

15

Projects/seminars

0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

The basic knowledge obtained in high school. The ability to think logically. The ability to mathematical description of simple problems. The ability to work in groups.

Course objective

The acquisition and consolidation of examples of basic mathematical concepts and acquire the ability to use the mathematical apparatus

Course-related learning outcomes

Knowledge:

The student defines matrices and determinants [P6S_WG_08].

The student describes systems of linear equations and lists methods for solving them [P6S_WG_08].

The student characterizes the concepts of vectors, scalar and vector products [P6S_WG_08].

The student names elements of a plane and line in space [P6S_WG_08].

The student explains the graphs of elementary and rational functions [P6S_WG_08].

The student recognizes the limits of functions [P6S_WG_08].

The student identifies inverse functions [P6S_WG_08].

The student classifies research methodologies in the context of management sciences [P6S_WG_11].

Skills:

The student plans and conducts experiments, including measurements and computer simulations [P6S_UW_09].

The student interprets the results of experiments and calculates their significance [P6S_UW_09].

The student formulates engineering tasks and solves them using analytical, simulation, and experimental methods [P6S_UW_10].

The student identifies and solves simple design tasks related to the construction and operation of machines [P6S_UW_14].

The student applies problem-solving methods in the field of construction and operation of machines [P6S_UW_15].

Social competences:

The student prepares and implements business ventures related to mathematics and engineering [P6S_KO_03].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Knowledge acquired during the lecture is verified during one test on the last lecture. The final grade consists of a test grade (80%) and a grade for activity during classes (20%). Passing threshold: 50% of the points.

Tutorials: The knowledge acquired during the tutorials is verified during one test at the end of the semester. During the classes, students receive points for activity, 80% of the final grade is the result of the test, and 20% of points for activity. Passing threshold: 50% of the points.

Programme content

Elements of linear algebra.

Functions of one variable.

Differential calculus of one-variable functions.

Tutorials: practical tasks.

Course topics

Elements of linear algebra:

- matrices and determinants,
- systems of linear equations,
- vectors, scalar and vector product,
- surface and straight line in space.

Functions of one variable:

- graphs of elementary and rational functions,
- function limits,
- inverse functions.

Differential calculus of one-variable functions.

Teaching methods

Lecture: oral presentation with examples and formulas, which are presented using a visualizer.

Tutorials: presentation of exemplary tasks on the blackboard and individual solving of similar examples by students - practical exercises.

Bibliography

Basic:

Foltyńska, Z. Ratajczak, Z. Szafranski, *Matematyka dla studentów uczelni technicznych, cz. I*, Wydawnictwo Politechniki Poznańskiej, Poznań, 2000

Additional:

W. Kryszicki, L. Włodarski, *Analiza matematyczna w zadaniach*, PWN, Warszawa, 1999

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	55	2,00