POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Mathematics [S1IZarz1E>MAT1]

Course

Field of study	**Year/Semester**
Engineering Management	1/1
Area of study (specialization)	**Profile of study**
–	general academic
Level of study	**Course offered in**
first-cycle	english
Form of study	**Requirements**
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	0	0
Tutorials	**Projects/seminars**	
15	0	

Number of credit points

4,00

Coordinators

dr Grzegorz Grzegorczyk
grzegorz.grzegorczyk@put.poznan.pl

Lecturers

dr hab. Maciej Ciesielski
maciej.ciesielski@put.poznan.pl

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:
- 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. Szafrański, Matematyka dla studentów uczelni technicznych, cz. I, Wydawnictwo Politechniki Poznańskiej, Poznań, 2000

Additional:
W. Krysicki, 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