COURSE DESCRIPTION CARD - SYLLABUS

Course name
Mathematics

Course

Field of study
Safety Engineering

Year/Semester
1/1

Area of study (specialization)

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
Polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
10	12	
Tutorials	Projects/seminars	

Number of credit points

5

Lecturers

Responsible for the course/lecturer:
Ph.D., D.Sc., Małgorzata Migda

Mail to: malgorzata.migda@put.poznan.pl

Faculty of Automatic Control, Robotics and Electrical Engineering

ul. Piotrowo 3A, 61-138 Poznań

Responsible for the course/lecturer:

Prerequisites

Basics of mathematics - secondary school level. Logical and scientific thinking, efficient calculating.

Course objective

The subject is aimed at introducing basic terms from the area of mathematics such as linear algebra and differential calculus; giving skills and competences for solving fundamental mathematic topics and for using mathematics in management.

Course-related learning outcomes

Knowledge

Student knows the issues of mathematics and statistics in the field of solving practical engineering problems [P6S_WG_04].

Skills

Student is able to properly select the sources and information derived from them, making an assessment, critical analysis and synthesis of this information [P6S_UW_01].

Student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks, also with the use of information and communication methods and tools [P6S_UW_04].

Social competences

Student is aware of the recognition of the importance of knowledge in solving problems in the field of safety engineering and continuous improvement [P6S_KK_02].

Student is aware of the responsibility for their own work and readiness to submit to the rules of working in a team and bearing responsibility for jointly performed tasks [P6S_KR_02].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: two homework and a written test on the last lecture.

Classes: evaluation of two written tests and the direct activity during the classes.

Programme content

Elements of linear algebra: matrices, inverse matrix, row of matrix, systems of linear equations (Cramer Theorem, method of Gaussian Elimination, Kronecker-Capelli Theorem). Applications of matrices in economics.

Elementary functions (formulas, graphs, properties). Sequences, monotonic sequences, the limit of a sequence, the arithmetic of limits. Continuity, limits of functions, asymptote. Derivative and its geometric interpretation, monotonicity intervals, extrema, L'Hospital's rule, application of the derivative in economics.

Teaching methods

- lecture with multimedia presentation accompanied with examples presented on the blackboard, theory presented with connections of current knowledge from previous lectures and with questions to the group of students;

- classes: solving problems on the board, initiating discassion about the solutions.

Bibliography

Basic

1. I. Foltyńska, Z. Ratajczak, Z. Szafrański, Matematyka dla studentów uczelni technicznych, cz. I -II, Wydawnictwo Politechniki Poznańskiej.

2. Podręczniki z serii Matematyka dla studentów politechnik, Oficyna Wyd. GiS: -
-- M. Gewert, Z. Skoczylas: Analiza matematyczna 1, Analiza matematyczna 2, Definicja, twierdzenia, wzory.

- M. Gewert, Z. Skoczylas, Analiza matematyczna 1, Przykłady i zadania.

- T. Jurlewicz, Z. Skoczylas, Algebra liniowa 1, Definicja, twierdzenia, wzory.

- T. Jurlewicz, Z. Skoczylas, ALgebra liniowa 1, Przykłady i zadania.

3. J. Banaś, Podstawy matematyki dla ekonomistów, WNT 2005.

Additional

W. Krysicki, L. Włodarski, Analiza matematyczna w zadaniach, cz. I, Wydawnictwo Naukowe PWN.

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	30	2,0
Student's own work (literature studies, preparation for classes, preparation for tests, homeworks preparation) [1]	95	3,0

[1] delete or add other activities as appropriate