POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name

Mathematics

Course

Field of study

Safety Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

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

Number of credit points

5

Lecturers

Responsible for the course/lecturer:

dr hab. Małgorzata Migda

email:malgorzata.migda@put.poznan.p

Wydział Elektryczny

ul. Piotrowo 3a, 60-965 Poznańl

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 has knowledge of selected aspects of higher mathematics: linear algebra, mathematical analysis, differential and integral calculus.

POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

Skills

Student is able to calculate determinants, determine the rank of a matrix, apply a matrix calculus to solve systems of linear equations. Is able to use differential and integral calculus in engineering practice. Can use basic knowledge of mathematics as a tool in management.

Social competences

Student understand necessity of systematic work and developing of their skills. Student is able to solve problems and work in team. Student is able search out some information in literature.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

- 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 discussion about the solutions.

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 rul; application of the derivative in economics.Indefinite integral, methods of integration. Definite integral and its application.

Teaching methods

Lecture: a written test on the last lecture.

Classes: evaluation of two written tests (on 7th and 14th weeks), two quizzes and the direct activity during the classes.

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.

POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

- 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	60	2,5
Student's own work (literature studies, preparation for classes, preparation for tests, prepatrotion for quizzes[1]	65	2,5

---

[1] delete or add other activities as appropriate