



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Mathematics

Course

Field of study

Environmental Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

18

Laboratory classes

0

Other (e.g. online)

0

Tutorials

20

Projects/seminars

0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr Marian Liskowski

Responsible for the course/lecturer:

email: marian.liskowski@put.poznan.pl

Faculty of Control, Robotics and Electrical
Engineering

Prerequisites

Basic knowledge of mathematics defined by the core curriculum of mathematics education at the advanced level in secondary school.

Course objective

1. Equipping the student with skills related to the use of concepts and methods of mathematical analysis to describe and analyze problems in the field of technical sciences.
2. Developing skills related to searching for explicit information, finding connections between dispersed information and developing the skills of formulating conclusions based on various premises.

Course-related learning outcomes

Knowledge

1. The student has knowledge of graphs and properties of elementary functions.



2. The student knows the concept of the limit function.
3. The student knows the concept of the derivative of a function and the geometric sense of a derivative of a function at a point, differentiation rules, the concept of indefinite integral and basic integration methods, the geometric sense of a definite integral of a function in a interval.

Skills

1. The student uses the concept of limit function to study the behavior of a function at the ends of the interval (s) of specificity.
2. The student uses methods of differential calculus to study the properties of functions.
3. The student uses the integral calculus for calculations resulting from the needs of engineering practice.
4. The student builds mathematical models of simple processes occurring in nature.
5. The student uses appropriately selected instruments of differential calculus to simulate the course of the above processes taking into account extreme states.

Social competences

1. The student is able to reflect and critically assess his own achievements.
2. The student is aware of the usefulness of mathematical competence in engineering practice.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during lectures is verified by means of a test consisting of 5 questions. Passing threshold: 60%.

Skills acquired during tutorials are verified on the basis of two tests. Each test includes 3 tasks of varying difficulty assessed in the points system. Passing threshold: 55%

Programme content

1. Elementary scalar functions (formulas, graphs, properties).
2. Concept of limit function and applications.
3. Differential calculus of one variable function with selected applications in engineering practice.
4. Integral calculus of one variable function with selected applications in engineering practice.

Teaching methods

Lecture: lecture conducted in an interactive way with the formulation of questions to students.



Tutorials: Solving example tasks on the board. Detailed review of the exercise. Initiate discussion on solutions.

Bibliography

Basic

1. M. Gewert, Z. Skoczylas, Analiza matematyczna 1 (Definicje, twierdzenia, wzory), Oficyna Wydawnicza GiS, Wrocław, 2011

2. I. Foltyńska, Z. Ratajczak, Z. Szafranski, Matematyka część I i II, Wydawnictwo Politechniki Poznańskiej, Poznań, 2004

Additional

1. M. Gewert, Z. Skoczylas, Analiza matematyczna 1 (Przykłady i zadania), Oficyna Wydawnicza GiS, Wrocław, 2006

2. W. Krywicki, L. Włodarski, Analiza matematyczna w zadaniach, t.1, Wydawnictwo Naukowe PWN, Warszawa, 2010

Breakdown of average student's workload

	Hours	ECTS
Total workload	80	3,0
Classes requiring direct contact with the teacher	38	1,5
Student's own work (literature studies, preparation for tutorials, preparation for tests/exam) ¹	42	1,5

¹ delete or add other activities as appropriate