



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Mathematics [N1ZiIP1>MAT2]

Course

Field of study

Management and Production Engineering

Year/Semester

1/2

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

24

Laboratory classes

0

Other (e.g. online)

0

Tutorials

26

Projects/seminars

0

Number of credit points

7,00

Coordinators

dr inż. Kinga Cichoń

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Lecturers

Prerequisites

The basic knowledge obtained in the first semester. The ability to think logically. The ability to describe simple mathematical problems.

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:

Has knowledge of selected problems of higher mathematics.

Knows the application of higher mathematics to solve technical problems.

Skills:

Can use the basic knowledge of higher mathematics as a tool in management.

Can use mathematical apparatus in studies.

Social competences:
Understands the need of developing mathematical knowledge.
Is aware of the need for lifelong learning.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Lectures: knowledge is verified on the basis of written exam. The exam consists of 10 short tasks and 10 calculation tasks.

Passing threshold: 50%

Tutorials: knowledge is verified on the basis of 4, 30-minute tests. Passing threshold: 50%

Programme content

INTEGRAL CALCULUS OF FUNCTIONS OF ONE VARIABLES. DEFINED INTEGRAL. MULTI-DIMENSIONAL INTEGRAL. ORDINARY DIFFERENTIAL EQUATIONS I AND II ORDER. LAPLACE TRANSFORMATION.

Course topics

LECTURE:

INTEGRAL CALCULUS OF FUNCTIONS OF ONE VARIABLES: indefinite integral - basic methods of integration and integration of faithful, irrational and trigonometric functions.

DEFINED INTEGRAL: Riemann integral and its application and improper integrals.

MULTI-DIMENSIONAL INTEGRAL: calculating, exchanging the order of integration of variables double integral for polar coordinates, the use of double integral in Cartesian and polar coordinates.

ORDINARY DIFFERENTIAL EQUATIONS: definition of ordinary differential equation, general and special solution, with separated variables, 1st order linear differential equation, complete equation, Bernoulli equation, 2nd order linear differential equation with constant coefficients.

LAPLACE TRANSFORMATION: definition of the Laplace transformation and its application for solving differential equations.

EXERCISES:

INTEGRAL CALCULUS OF FUNCTIONS OF ONE VARIABLES: indefinite integral - basic methods of integration and integration of functions: faithful, irrational and trigonometric.

DEFINED INTEGRAL: Riemann integral and its application and improper integrals.

MULTI-DIMENSIONAL INTEGRAL: normal area, double integral - calculation, conversion of integration order, conversion of variables in double integral to polar coordinates, use of double integral in Cartesian and polar coordinates.

ORDINARY DIFFERENTIAL EQUATIONS: ordinary differential equations with separated variables, homogeneous equation, ordinary heterogeneous 1st order linear differential equation, 2nd order ordinary differential heterogeneous equation with constant coefficients.

Teaching methods

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

Tutorials: presentation of sample tasks on the board followed by independent solving of similar examples by students.

Bibliography

Basic

Fołyńska, Szafranski, Ratajczak, Matematyka cz I, cz II, Wydawnictwo Politechniki Poznańskiej, Poznań 2004.

Additional

W. Krysicki, L. Włodarski, Analiza matematyczna w zadaniach 1, Wydawnictwo Naukowe PWN, Warszawa, 2013.

F. Leja, Rachunek różniczkowy i całkowy. Państwowe Wydawnictwo Naukowe, Warszawa 1978.

Breakdown of average student's workload

	Hours	ECTS
Total workload	175	7,00
Classes requiring direct contact with the teacher	50	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	125	5,00