POZNAN UNIVERSITY OF TECHNOLOGY

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Mathematics [N1MiBM1>MAT2]

Course

Field of study	Year/Semester
Mechanical Engineering	1/2
Area of study (specialization)	Profile of study
–	general academic
Level of study	Course offered in
first-cycle	polish
Form of study	Requirements
part-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	0	0
Tutorials	Projects/seminars	
32	0	

Number of credit points

8,00

Coordinators	Lecturers
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Prerequisites

1. Student has knowledge of mathematics in the field covered by teaching in the first course with the basics of high school. 2. Student has the ability to think logically, associate facts, analyze problems and apply the right conclusions. 3. Students seriously treat the process of studying.

Course objective

Getting comprehensive skills in the use of advanced mathematical apparatus and classical calculation methods in practical applications, with emphasis on the close relationship between mathematics and various branches of technical sciences, and showing its wide range of applications, also by mechanical engineers.

Course-related learning outcomes

Knowledge:
After completing the first degree studies, the graduate has expanded and in-depth knowledge of various branches of higher mathematics and detailed knowledge on the application of mathematical methods and tools in engineering and mechanical sciences - K_W2.

Skills:
After completing the first degree studies, the graduate:
- can use knowledge of higher mathematics; can build and analyse simple mathematical models; can use mathematical tools and methods, including numerical ones, to solve engineering problems - K_U13,
- is able to plan and implement self-education independently in order to raise and update their competences - K_U24.

Social competences:
After completing the first degree studies, the graduate:
- is aware of the deepening and expansion of knowledge to solve newly created technical problems - K_K1.
- understands and appreciates the importance of intellectual honesty in own and other people"s actions; is ready to demonstrate reliability, impartiality, professionalism and an ethical attitude - K_K1.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lecture: written exam during session,
Tutorials: long test + short tests (10 minutes).

Programme content

1. The definite integral. Interpretation of definition and calculus methods. Applications of the definite integral. Improper integrals.
2. Ordinary differential equations of first and second order. Solving methods and applications.
3. Differential calculus of functions of many variables. Partial derivatives, extrema of functions of two variables, total diferential and applications.
4. Integral calculus of functions of many variables. Double integral over a rectangle and a normal area. Double integral in polar coordinates. Triple integral. Applications of double and triple integrals.

Teaching methods

Lecture: multimedial presentation + blackboard,
Tutorials: solving of problems; discussion about obtained results.

Bibliography

Basic
1. I.Foltyńska, Z.Ratajczak, Z.Szafrański, Matematyka dla studentów uczelni technicznych, Wydawnictwo PP, t.2 i 3, Poznań 2000
2. W.Krysicki, L.Włodarski, Analiza matematyczna w zadaniach, t.2, PWN 1994
3. W.Stankiewicz, Zadania z matematyki dla wyższych uczelni technicznych, t.2, PWN 1995
Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	122	8,00
Classes requiring direct contact with the teacher	72	4,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	50	4,00