



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Mathematics [N1Mech1>MAT2]

Course

Field of study
Mechatronics

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
30

Laboratory classes
0

Other (e.g. online)
0

Tutorials
30

Projects/seminars
0

Number of credit points

8,00

Coordinators

Lecturers

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Prerequisites

Basic knowledge of differential calculus of one variable functions (first term).

Course objective

The aim is: - to recognize methods and applications of integral calculus of single variable functions, differential and integral calculus of functions of two variables, some types of differential equations, - to teach how to use those concepts, to make proper transformations and to use appropriate mathematical methods and tools to solve typical engineering tasks.

Course-related learning outcomes

none

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written exam to check theoretical knowledge and the ability of its practical use. Exam is passed if student gains 50% of all points.

Classes: 2 written tests during the and semester and activity during tutorials. Students have an opportunity to gain additional points (10% from the total) for their activity (e.g. giving correct answers to teacher's or colleagues' questions).

Range of grades:

60% - 3,0

68% - 3,5

76% - 4,0

84% - 4,5

92% - 5,0

Programme content

Lecture and tutorials: Indefinite integral – methods of evaluation (integration by parts and by substitution, integration of rational functions). Definite integral. Applications of the definite integral: calculation of measure of areas, the length of curves, volumes and surface areas of solids of revolution. Differential calculus of functions of two variables - total differential and extrema. Double integral - definition, interpretation, evaluation (iterated integral, polar coordinates). Solutions of some types of differential equations.

Teaching methods

1. Interactive lecture with questions to the group of students which is supported by solving examples on board.
2. Classes during which students solve tasks on board. Teacher's detailed assessment of students' solutions followed by discussion and comments.

Bibliography

Basic

1. W. Żakowski, M. Kołodziej, *Matematyka. Cz. 2, Analiza matematyczna*, WNT, Warszawa 2013.
2. I. Foltyńska, Z. Ratajczak, Z. Szafranski, *Matematyka, cz. II, III*, Wyd. Politechniki Poznańskiej, Poznań 2004.
3. F. Leja, *Rachunek różniczkowy i całkowy*, PWN, Warszawa, 2008.

Additional

1. W. Krysicki, L. Włodarski, *Analiza matematyczna w zadaniach. Część I, II*, PWN, Warszawa 2013.
2. W. Stankiewicz, *Zadania z matematyki dla wyższych uczelni technicznych. Część I, II*, PWN, Warszawa 2012.
3. M. Gewert, Z. Skoczylas, *Analiza matematyczna 1 i 2*, Oficyna Wyd. GiS, Wrocław 2012.

Breakdown of average student's workload

	Hours	ECTS
Total workload	0	0,00
Classes requiring direct contact with the teacher	0	0,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	0	0,00