POZNAN UNIVERSITY OF TECHNOLOGY

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Methodology of constructing machines for earth and road works [N2MiBP1-MR>MKMdRZiD2]

Course

Field of study	Year/Semester
Mechanical and Automotive Engineering	2/3

Area of study (specialization)	Profile of study
Heavy-duty Machines	general academic

Level of study	Course offered in
second-cycle	Polish

Form of study	Requirements
part-time	compulsory

Number of hours

Lecture	Laboratory classes	Other
0	0	0

Tutorials	Projects/seminars	
9	0	

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

Knowledge: Has basic knowledge of the construction and operation of earthmoving machines and road
Skills: Can use office and basic software CAD software Social competences: Has basic communication and group cooperation skills

Course objective

Systematizing general knowledge about construction and practicing how to use it to solve construction problems on specific examples from earth and road works machinery

Course-related learning outcomes

Knowledge:
Has extended knowledge of modern construction materials such as carbon plastics, composites, ceramics, in terms of their construction, processing technology and applications.
Has extensive knowledge of modern machine manufacturing technologies in the field of designing the production process of machine parts and their assembly using computer CAM tools
Has a general knowledge of the principles and methods of constructing working machines, in particular the methods of functional and strength calculations, mathematical optimization of mechanical

structures and modeling of machine structures in 3D systems.

Skills:
He can estimate the cost of making a working machine or a vehicle with a high degree of complexity from a selected group of machines.
Can perform a medium complex design of a working machine or its assembly using modern CAD tools, including tools for spatial modeling of machines and calculations using the finite element method.
He can design the technology of exploitation of a selected machine with a high degree of complexity.

Social competences:
He is ready to critically assess his knowledge and received content.
It is ready to fulfill social obligations, inspire and organize activities for the benefit of the social environment.
It is ready to initiate actions for the public interest.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Final project of exercise classes

Programme content

General machine construction algorithms. Formulating design requirements for earth and road machinery. Searching for design solutions, industry catalogs, patents, solutions available on the market. Heuritic techniques. Optimization in constructing machines for earth and road works - criteria functions and limitations. Geometric modeling. Strength calculations, selection of materials

Course topics

Teaching methods

1. Exercises - project

Bibliography

Basic
1. Pahl g. Beitz W. Nauka konstruowania WNT
2. Pieczonka K. Inżynieria maszyn roboczych OWPW
Additional
1. Tarnowski W. Optymalizacja i polioptymalizacja w technice, Koszalin, 2011
2. Praca Zbiorowa red. Jan Szlagowski. Automatyzacja pracy maszyn roboczych. Metodyka i zastosowania

Breakdown of average student's workload

	Hours	ECTS
Total workload	15	1,00
Classes requiring direct contact with the teacher	9	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	6	0,50