



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Methodology of constructing machines for earth and road works

Course

Field of study

Mechanical and Automotive Engineering

Area of study (specialization)

Level of study

Second-cycle studies

Form of study

part-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

0

Laboratory classes

0

Other (e.g. online)

0

Tutorials

9

Projects/seminars

0

Number of credit points

1

Lecturers

Responsible for the course/lecturer:

dr inż. Łukasz Gierz

Responsible for the course/lecturer:

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Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3, 60-965 Poznań

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:

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. Heuristic techniques. Optimization in constructing machines for earth and road works - criteria functions and limitations. Geometric modeling. Strength calculations, selection of materials

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	1,0
Classes requiring direct contact with the teacher	9	0,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	6	0,5

¹ delete or add other activities as appropriate