



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Machines

Field of study

Construction and Exploitation of Means of Transport

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

### Course

Year/Semester

1/1

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Lecture

36

Laboratory classes

Tutorials

Projects/seminars

### Number of hours

Other (e.g. online)

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

dr hab. inż. Ireneusz Malujda, prof. PPemail:

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61 224-4513 Wydział Inżynierii Mechanicznejul.

Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

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2244Wydział Inżynierii Mechanicznejul.

Piotrowo 3, 60-965 Poznań

### Prerequisites

1 Knowledge Basic knowledge of general mechanics, physics and technical drawing.

2 Skills Ability of logical and creative thinking, using the Internet and library resources

3 Social competencies understands the need for continuous learning and acquiring new knowledge

### Course objective

1 Knowledge Basic knowledge of general mechanics, physics and technical drawing.

### Course-related learning outcomes

Knowledge

1. Has a knowledge of physics, including the basics of classical mechanics, optics, electricity and



magnetism, solid state physics, quantum and nuclear physics, necessary to understand the specialized lectures on the theory of structural materials and materials science, the theory of machines and mechanisms, theory of electrical drives and mechatronic systems. - [K1A\_W02]

2. Has a basic knowledge of the basics of machine design and the theory of machines and mechanisms, including mechanical vibration. - [K1A\_W05]
3. Has a basic knowledge of technical fluid mechanics (ideal gases and ideal fluids), Newtonian and non-Newtonian viscous fluids, heat and fluid flow machinery. - [K1A\_W07]

#### Skills

1. Is able to develop an operation technology of a selected, complex machine. - [K1A\_U11]
2. Is able to assess potential negative impacts for the natural environment and humans, originating from the designed machine or a vehicle from the selected equipment group. - [K1A\_U14]

#### Social competences

1. Understands the need for lifelong learning; is able to inspire and organize the learning process of others. - [K1A\_K01]
2. Is aware of and understands the importance and impact of non-technical aspects of mechanical engineering activities and its impact on the environment, is aware of responsibility for decisions. - [K1A\_K02]

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Pass the course on the basis of a written work

#### Programme content

Simplified design of the machine records . Hulls and superstructures . Propulsion systems . Working bodies of the machine. Shafts and axles. Spring - types , functions, applications. Bearings , sliding bearings . Seal of bearing . Wheels and gearing - the basic message . Gears friction . Clutch types of functions . Brakes, types , principles of operation. Classification engine . Reciprocating internal combustion engines of two and four-stroke . Construction of crank - piston mechanism and timing . Lubrication and cooling motors. Power supply and exhaust of the engine. Topping engines . Emission of toxic substances - catalysts . Engines, turbines and rocket . Turbine types , the essence of action. Pumps, distribution , construction , principle of operation. Gyms - distribution function of elements. Non-conventional energy equipment . Heat pumps - principle of operation , applications. Construction Technology . Transport machines including heavy working machines and equipment handling . Propulsion systems cranes, jib cranes and conveyors . Motor vehicles , an outline of the construction and function of the basic systems : brake, suspension , drive train.



## Teaching methods

The lecture is conducted using a Power Point presentation and a classical board

## Bibliography

Basic

1. Jan Kijewski, Andrzej Miller - Maszynoznawstwo
2. J. Gronowicz - Maszynoznawstwo ogólne
3. J. Łęgiewicz - Poznaj samochód

Additional

1. Z. Tomaszewski - Wprowadzenie do techniki

## Breakdown of average student's workload

	Hours	ECTS
Total workload	115	4,0
Classes requiring direct contact with the teacher	60	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	55	2,0

<sup>1</sup> delete or add other activities as appropriate