



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Machines

Course

Field of study

Mechanical and Automotive Engineering

Area of study (specialization)

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Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/4

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

60

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Maciej Bajerlein

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tel. 61 6475959

Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

dr inż. Grzegorz Kinal

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tel. 61 647-5852

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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

Has knowledge in the field of physics, including the basics of classical mechanics, optics, electricity and magnetism, solid state physics, quantum and nuclear physics, necessary to understand specialist lectures in the field of the theory of construction materials and materials science, theory of machines and mechanisms, theory of electric drives and mechatronic systems.

Has basic knowledge of the basics of machine design and the theory of machines and mechanisms, including mechanical vibrations.

Has basic knowledge of the technical mechanics of fluids, i.e. ideal liquids and gases, Newtonian and non-Newtonian viscous liquids, theory of thermal-flow machines.

Skills

Can search in catalogs and on manufacturers' websites ready-made machine components to be used in his own projects.

Can use computer office packages for editing technical texts, including formulas and tables, technical and economic calculations using a spreadsheet and running a simple relational database.

Can draw a diagram and a simple machine element by hand in accordance with the rules of technical drawing.

Social competences

Is ready to critically assess his knowledge and received content.

Is ready to initiate actions for the public interest.

is ready to fulfill professional roles responsibly, including:

- observing the rules of professional ethics and requiring this from others,
- caring for the achievements and traditions of the profession.

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	100	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) ¹	40	2,0

¹ delete or add other activities as appropriate