STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Machines		**1010601211010640175**

Field of study	Profile of study (general academic, practical)	Year /Semester
Mechanical Engineering	**(brak)**	**1 / 1**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**full-time**

No. of hours				No. of credits
Lecture: **4**	Classes: **-**	Laboratory: **-**	Project/seminars: **-**	**4**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**4 100%**
Technical sciences	**4 100%**

Responsible for subject / lecturer:

dr hab. inż. Ireneusz Malujda, prof. PP
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tel. 61 665-2244
Transport Engineering
ul. Piotrowo 3, 60-965 Poznań

Responsible for subject / lecturer:

dr inż. Krzysztof Talaśka
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tel. 61 665-2246
Transport Engineering
ul. Piotrowo 3, 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

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.

Assumptions and objectives of the course:

The role of machines in energy transformation. Classification of machines. The characteristic parameters of the machines.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Has knowledge in physics, including the basics of classical mechanics, optics, electricity and magnetism, solid state physics, quantum and nuclear physics, necessary to understand specialized lectures in the theory of construction materials and materials, theory of machines and mechanisms, the theory of electric drives and mechatronic systems - [M1_W02]
2. Has basic knowledge of the basics of machine construction and the theory of machines and mechanisms, including mechanical vibrations - [M1_W05]
3. Has basic knowledge in the field of technical fluid mechanics, i.e. liquids and perfect gases, Newton and non-Newtonian viscous liquids, theory of thermal and flow machines - [M1_W07]

Skills:

1. Is able to 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 - [M1_U03]
2. He can draw a schematic and a simple machine element in accordance with the principles of technical drawing - [M1_U22]

Social competencies:

1. Is ready to critically evaluate your knowledge and content you receive - [M1_K01]
2. He is ready to responsibly perform professional roles, including: observing the rules of professional ethics and requirements from others, caring about the achievements and traditions of the profession - [M1_K06]

Assessment methods of study outcomes

Written exam

Course description

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.

Basic bibliography:

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

Additional bibliography:

1. Z. Tomaszewski - Wprowadzenie do techniki

Result of average student's workload

Activity	Time (working hours)
1. Participation in the lecture	60
2. Memorizing the content of the lecture	20
3. Consultations	2
4. Preparation for the exam	10
5. Exam	2

Student's workload

Source of workload	hours	ECTS
Total workload	94	4
Contact hours	64	3
Practical activities	0	0