

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Machines</b>		Code <b>1010604111010640175</b>
Field of study <b>Mechanical Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>1 / 1</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>20</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b>		ECTS distribution (number and %) <b>2 100%</b>
<b>Responsible for subject / lecturer:</b>  dr hab. inż. Ireneusz Malujda email: ireneusz.malujda@put.poznan.pl tel. 2244 MRiT http://www.fwmt.put.poznan.pl/		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge of general mechanics, physics and technical drawing.
2	<b>Skills</b>	Ability of logical and creative thinking, using the Internet and library resources
3	<b>Social competencies</b>	understands the need for continuous learning and acquiring new knowledge
<b>Assumptions and objectives of the course:</b> The role of machines in energy transformation. Classification of machines. The characteristic parameters of the machines.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
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]		
<b>Skills:</b>		
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]		
<b>Social competencies:</b>		
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]		
<b>Assessment methods of study outcomes</b>		

written exam		
<b>Course description</b>		
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.		
<b>Basic bibliography:</b>		
1. Jan Kijewski, Andrzej Miller -Maszynoznawstwo 2. J. Gronowicz - Maszynoznawstwo ogólne 3. J. Łęgiewicz - Poznaj samochód		
<b>Additional bibliography:</b>		
1. Z. Tomaszewski - Wprowadzenie do techniki		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Udział w wykładzie	60	
2. Utrwalanie treści wykładu	20	
3. Konsultacje - wykład	2	
4. Przygotowanie do egzaminu	10	
5. Udział w egzaminie	2	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	94	1
Contact hours	64	1
Practical activities	0	0