

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Basics of Drive Design of Transport Means		Code 1010621251010645112
Field of study Transport	Profile of study (general academic, practical) (brak)	Year /Semester 3 / 5
Elective path/specialty Ecology of Transport	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 1 Classes: 1 Laboratory: - Project/seminars: 1		No. of credits 5
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 5 100%
Responsible for subject / lecturer: dr inż. Ryszard Raczyk email: ryszard.raczyk@put.poznan.pl tel. 61 665 2054 Faculty of Working Machines and Transportation Piotrowo 3		Responsible for subject / lecturer: mgr inż. Mateusz Kukla email: mateusz.kukla@put.poznan.pl tel. 61665 2053 Faculty of Working Machines and Transportation Piotrowo 3
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Student has knowledge of physics (mechanics in province of: statics, kinematics and dynamics), mathematics and basics of machine design I.
2	Skills	Student has the ability to solve problems concerning the basics of machine design based on their knowledge and ability to obtain information from given sources.
3	Social competencies	Student is able to work in a group performing different roles
Assumptions and objectives of the course: To provide knowledge of basics of machine design in the field of means of power transmissions. The practical use of the knowledge gained from the courses: strength of materials, materials science, theory of machines.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has basic knowledge of the basics of machine design and the theory of machines and mechanisms, structure of propulsion system and function of drive gears - [K1A_W05]		
2. Has knowledge of basics of machine design and theory of machines, construction and basic parameters of mechanical gears - [K1A_W05]		
3. Has basic knowledge of basics of machine design and theory of machines and mechanisms, clutches, basic drive parameters and types of drives - [K1A_W05]		
4. Has basic knowledge of the principles of gear selection and the calculation of torques and ratios - [K1A_W05]		
5. Has basic knowledge of stress distribution in gearing wheels and design calculations of gears - [K1A_W05]		
6. Has basic knowledge of characteristics of belt drives, forces and stresses in cords of belt and chain - [K1A_W05]		
7. Has basic knowledge of calculation efficiency and transmitted power of belt and chain drive - [K1A_W05]		
8. Has basic knowledge of designing machine power transmission systems, machine components such as axles and shafts, bearings, couplings - [K1A_W13]		
Skills:		

<p>1. Is able to obtain information from the literature, internet, databases and other sources - [K1A_U01]</p> <p>2. Is able to communicate using a variety of techniques in a professional environment and other environments using the formal record of the design, technical drawings, concepts and definitions in the scope of the study area - [K1A_U02]</p> <p>3. Can use learned mathematical theories to create and analyze simple models of propulsion systems and their components - [K1A_U07]</p> <p>4. Is able to analyze objects and technical solutions, can search the catalogs and websites for machinery and equipment components - [K1A_U10]</p>
Social competencies:
<p>1. Understands the need and knows the possibilities of lifelong learning, knows the need for acquiring new knowledge for professional development - [K1A_K01]</p> <p>2. Is aware of and understands the importance and impact of non-technical aspects of mechanical engineering activities and its impact on the environment and responsibility for own decisions in short and long-term aspect - [K1A_K02]</p> <p>3. Is able to define the tasks and priorities for their implementation for himself and the coworkers team - [K1A_K05]</p>

Assessment methods of study outcomes		
Passing the exam, exercises and projects		
Course description		
<p>The structure of machine drive system, functions of gear, clutch, basic parameters of drive, drive types, kinematics diagrams. Division of couplings, design overview and applications. Clutch: fixed, controlled, flexible, overload. Calculation of clutches and the rules for the selection from the catalogs The overall division of gears, kinematics diagrams, design review, the basic parameters. Rules for selection of gear, calculation of torques and ratios. Gears: classification, principle of meshing, outline of the teeth. Helical gear: meshing geometry, kinematics, geometric parameters of the wheels, interdental force, basics of design. Stress state in gear wheel teeth. Design calculations of spur gears. General characteristics of belt drives, power and stress in belt cords, power transition and gear efficiency. Calculation and selection of the design characteristics of belt drives. Transmission chains. Friction gears, wheels material selection, slipping, efficiency</p>		
Basic bibliography:		
<p>1. B. Branowski (red), Podstawy konstrukcji napędów maszyn, WPP Poznań 2007</p> <p>2. J. Żółtowski, Podstawy Konstrukcji Maszyn, Oficyna Wydawnicza Politechniki Warszawskiej, 2002</p> <p>3. Z. Osiński Podstawy konstrukcji maszyn, PWN Warszawa 2002</p> <p>4. A. Dziurski, L. Kania, A. Kasprzycki, E. Mazanek, Przykłady obliczeń z Podstawy Konstrukcji Maszyn, Tom 1 i 2, WNT, Warszawa 2005</p>		
Additional bibliography:		
<p>1. Dietrich M (red): Podstawy konstrukcji maszyn., WNT, Wa-wa, 1999</p> <p>2. R. Knosala, A. Gwiazda, A. Baier, P. Gendarz, Podstawy Konstrukcji Maszyn, WNT, Warszawa 2000</p> <p>3. Z. Skrzyszowski, Reduktor stożkowo-walcowy PKM ? projektowanie, WPK Krakw 2005</p>		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	15	
2. Consultation on the material given in lectures	2	
3. Exam Preparation	10	
4. Participation in the exam	2	
5. Participation in class exercises	15	
6. The consolidation exercise of Contents	10	
7. Preparing to pass	10	
8. Participation in the project activities	15	
9. Preparation of the project	30	
10. Consultation project	5	
Student's workload		
Source of workload	hours	ECTS
Total workload	102	5
Contact hours	52	3
Practical activities	40	2