

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Basics of Machine Design		Code 1010601241010640394
Field of study Mechanical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 2 / 4
Elective path/specialty -	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: 2 Classes: - Laboratory: - Project/seminars: 2		No. of credits 4
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 Technical sciences		ECTS distribution (number and %) 4 100% 4 100%
Responsible for subject / lecturer: dr hab. inż. Ireneusz Malujda, prof. PP email: Ireneusz.Malujda@put.poznan.pl tel. 61 665-2244 Working Machines and Transportation Piotrowo 3, 60-695 Poznań		Responsible for subject / lecturer: dr inż. Krzysztof Talaśka email: krzysztof.talaska@put.poznan.pl tel. 61 224-4512 Working Machines and Transportation Piotrowo 3, 60-695 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Knowledge of physics (statics, kinematics and dynamics), mathematics, after completing the program of study.
2	Skills	Problem-solving skills of the basics of machine design based on their knowledge, ability to obtain the information from identified sources.
3	Social competencies	Understanding of the need to broaden their competence, willingness to work together as a team.
Assumptions and objectives of the course:		
1. Provide students with knowledge of the basics of machine design 2. Develop students' skills: - calculation and design of components and assemblies of machines, - making and reading the technical documentation on the basis of the knowledge from the subject of Engineering Drawing - practical use of the knowledge gained from the course: Mechanics, Strength of materials, Theory of machines, Materials. 3. Development of students' teamwork skills.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has a basic knowledge of the basics of machine design and the theory of machines and mechanisms, including mechanical vibration.- - [K1A_W05] 2. Has a basic knowledge of the basics of machine design and the theory of machines and mechanisms, including mechanical vibration - [K1A_W06] 3. Has a basic knowledge of the strength of materials, including basics of the theory of elasticity and plasticity, strength effort hypotheses, methods for calculating beams, diaphragms, shafts, connections and other simple components, as well as methods for testing the strength of materials, strain and stress on mechanical structures - [K1A_W11] 4. Has a basic knowledge of manufacturing techniques used in the machine industry, such as casting, metal forming, decremental and incremental processing, welding and other bonding techniques, cutting, coating and surface treatment - [K1A_W15]		
Skills:		

<p>1. Is able to prepare technical documentation (descriptive and graphic) of an engineering task - [K1A_U04]</p> <p>2. Is able to use acquired mathematical theories to create and analyze simple mathematical models of machines, their components and simple technical systems - [K1A_U07]</p> <p>3. Is able to create a diagram of a system, select its items and perform basic calculations using ready-made computational packages for mechanical propulsion of a machine - [K1A_U09]</p> <p>4. Is able to perform strength calculations of frames and supporting structures in machines using basic theories of strength - [K1A_U10]</p> <p>5. Is able to use popular packages for technical drawings edition and 3D modeling in sufficient detail to enable the creation of documentation in accordance with the applicable standards and models of virtual machines in three-dimensional space - [K1A_U12]</p> <p>6. Is able to hand draw a simple schematic or a machine component in accordance with the principles of technical drawing - [K1A_U14]</p>
<p>Social competencies:</p> <p>1. Understands the need and knows the possibilities of lifelong learning - [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 - [K1A_K02]</p> <p>3. Is aware of the importance of behavior in a professional manner, compliance with the rules of professional ethics and respect for cultural diversity - [K1A_K03]</p> <p>4. Has a sense of responsibility for one's own work and is willing to comply with the principles of teamwork and taking responsibility for collaborative tasks - [K1A_K04]</p>

Assessment methods of study outcomes	
<p>Forming assessment:</p> <p>a) in a scope of the project: assessment of current progress of the project</p> <p>b) in a scope of lectures: assessment of the answers for the questions concerning the knowledge which was presented during previous lectures</p> <p>Summarizing assessment:</p> <p>a) in a scope of project: assessment of the course of work on the project and the final result of the project</p> <p>b) in a scope of lectures: written exam.</p>	
Course description	
<p>The basic principles of the design process, elements of the mechanism, the characteristics of workloads, defining loads and appropriate strength conditions. Connections and their calculation: soldered, welded, glued, riveted joints, fasteners: T-slot nuts, bolt, screw connections. Screw mechanisms: examples and applications, structural calculations. Susceptible elements: springs, rubber components susceptible.</p>	
Basic bibliography:	
<p>1. Praca zbiorowa pod red. Z. Osińskiego, Podstawy konstrukcji maszyn, PWN, W-wa, 1999</p> <p>2. Praca zbiorowa pod red. M. Dietricha: Podstawy konstrukcji maszyn. Tom 3, WNT, Wa-wa, 1999</p> <p>3. Osiński Zbigniew, Sprzęgła, PWN, Warszawa 1998</p> <p>4. Dziama A., Michniewicz M., Niedźwiedzki A.: Przekładnie zębate. PWN, Wa-wa, 1989</p> <p>5. Dudziak M.: Przekładnie cięgnowe. PWN, Warszawa, 1997.</p>	
Additional bibliography:	
<p>1. Niemann G., Maschinenelemente t. I, II, III, Springer Verlag Berlin, 1965</p> <p>2. Müller L., Przekładnie obiegowe, PWN, Warszawa, 1983</p> <p>3. Bahl G., Beitz W., Nauka konstruowania, WNT, Warszawa 1984</p>	
Result of average student's workload	
Activity	Time (working hours)
1. Lectures	30
2. Consultations	4
3. Preparation to pass the exam	12
4. Participation in the exam	2
5. Participation in the project classes	30
6. Preparation to the project classes	15
7. Preparing to pass the project	30
Student's workload	

Source of workload	hours	ECTS
Total workload	108	4
Contact hours	66	3
Practical activities	62	2