

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject ENGINEERING SUPPORTING FOR DISABLED		Code 1010601221010628482
Field of study Mechanical Engineering	Profile of study (general academic, practical) general academic	Year /Semester 1 / 2
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: 1 Laboratory: - Project/seminars: -		No. of credits 3
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 3 100% 3 100%
Responsible for subject / lecturer: Marek - Zablocki email: marek.zablocki@put.poznan.pl tel. 616652056 IT ul. Piotrowo 3		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	basic knowledge of technology
2	Skills	logic thinking, the use of information obtained from internet, standards, catalogues
3	Social competencies	bases skills action in team, understanding of the need for an example of knowledge.
Assumptions and objectives of the course: Getting basic knowledge about: structure, action and the importance of development and technique design of means dedicated to disabled persons and older age people		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has a basic knowledge in biomechanics and biological - [K1A_W03] 2. Is up-to-date with the latest trends in mechanical engineering, i.e. machine design and construction processes, increase in safety and ease of operation, use of modern construction materials - [K1A_W18]		
Skills:		
1. Is able to obtain information from the literature, internet, databases and other sources. Can integrate the information to interpret and learn from them, create and justify opinions - [K1A_U03] 2. Is able to plan and carry out the process formulate requirements - [K1A_U19]		
Social competencies:		
1. Understands the need and knows the possibilities of lifelong learning. - [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 and responsibility for own decisions. - [K1A_K02]		
Assessment methods of study outcomes		
Lecture: written exam ? test Classes: credit on the basis of test, homework, class activity		

Course description		
<p>Problem section of rehabilitation engineering and assistive technology Technique measure in medical, social and professional rehabilitation Concept of disability Contemporary reasons research and design technique measure in rehabilitation engineering Statistics and reasons request for technique measures rehabilitation engineering Design for people with disabilities ? design process, design work team, design principles, examples. Biomechanics ? definition, space of work Human operational potential ? elements, functions Biocinematic chain, number of degrees of freedom, locomotor system of human, moment biomechanism Center of gravity Basic features and structure of supporting devices (definition geometry and cinematics based on anthropometrical features of human, control methods of devices, choosing materials). Wheelchairs ? definition and classification Wheelchairs ? functions, structure, progress and tendencies Modular construction, construction series based on manual wheelchair: Design of frame active wheelchair (dimensions, structure of construction nodes). Requirements regarding using type active wheelchair (support of spine, support of human body, ideal position of body) Energy efficiency and wheelchair dynamics. Individual means of transport and collective disabled persons. Devices supporting in means of transport ? functions, application, universal design principles. Principles of construction technical measures dedicated to disabled persons and older age people. Rehabilitation devices (wheelchairs, car, means of collective transport, hospital beds, rehabilitation equipment, lifts, medical rehabilitation gear)</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Wprowadzenie do inżynierii rehabilitacyjnej, red. M. Zabłocki, Wyd. WMRIIT, Poznań 2017 2. Projektowanie dla seniorów i osób z niepełnosprawnościami, badania, analizy, oceny, konstrukcje, red. B. Branowski, Wyd. WMRIIT PP, Poznań 2015 3. Innowacyjne koncepcje i konstrukcje produktów dla osób niepełnosprawnych i w starszym wieku, red. B. Branowski, Wyd. CIRITT PP, Poznań 2013 4. Sydor M., Wybór i eksploatacja wózka inwalidzkiego, Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu, Poznań 2003 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Biomechanika i inżynieria rehabilitacyjna, red. R. Będziński i inni, Wyd. Akademicka Oficyna Wydawnicza EXIT, Warszawa 2004 2. Pańniczek R., Wybrane urządzenia wspomagające i fizjoterapeutyczne w rehabilitacji porażen ośrodkowego układu nerwowego i amputacjach kończyn, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 1998 3. Marciniak J., Szewczenko A., Sprzęt szpitalny i rehabilitacyjny, Wydawnictwo Politechniki Śląskiej, Gliwice 2003 		
Result of average student's workload		
Activity	Time (working hours)	
1. Preparation for the lecture, exercises	6	
2. Participation in the lecture, exercises	45	
3. Fixing the content of the lecture	8	
4. Participation in consultations	2	
5. Preparation for the sentence	10	
6. Participation in passing the lecture, classes	4	
Student's workload		
Source of workload	hours	ECTS
Total workload	75	3
Contact hours	45	0
Practical activities	0	0