

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Designing and evaluation of products</b>		Code <b>1011102221011126444</b>
Field of study <b>Safety Engineering - Full-time studies - Second-</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>1 / 2</b>
Elective path/specialty <b>Ergonomics and Work Safety</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>elective</b>
Cycle of study: <b>Second-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>15</b> Classes: <b>30</b> Laboratory: <b>-</b> Project/seminars: <b>15</b>		No. of credits <b>5</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> <b>Technical sciences</b>		ECTS distribution (number and %) <b>100 5%</b> <b>100 5%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Marcin Butlewski email: marcin.butlewski@put.poznan.pl tel. 605883000 Wydział Inżynierii Zarządzania ul. Strzelecka 11 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	has basic knowledge of equipment, objects and technical systems life cycles knows main methods, techniques and materials that are applied in the process of solving complex engineering tasks relating to the studied area has indispensable knowledge of understanding social, economic, legal and other non-technical conditions of an engineering activity and their inclusion in engineering practice
2	<b>Skills</b>	can acquire data from literature, database or other properly matched sources, also in English
3	<b>Social competencies</b>	can work in a group
<b>Assumptions and objectives of the course:</b> The main objective of the course is to acquaint the students with the methods of engineering design and ways that allow to solve engineering problems in a syntetic and practical way.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. has basic knowledge of equipment and machines life cycle - [K2A_W15] 2. knows fundamental methods, techniques, tools and materials that are applied in solving simple engineering tasks relating Security Engineering - [K2A_W16] 3. knows phenomena that are characteristic of processes in products design - [K2A_W09] 4. have a basic understanding of the life cycle of equipment, facilities, and technical systems in the context of ergonomic conditions and know the phase of the production process, the division of labor process into its constituent parts, the specificity of human tasks in the techniques of manufacturing, in services and conceptual work and office design principles - [K2A_W21] 5. knows the ways of overcoming the contradictions technical analysis of ways of overcoming the technical problems on the example of inventive problem solving algorithm, knows the rules of modeling decision-making processes with regard to cognitive psychological factors - [K2A_W24]		
<b>Skills:</b>		
1. can conduct a critical analysis of the ways in which technical solutions - [K2A_U15] 2. can suggest improvements (advancements) of existing technical solutions that are characteristic of Security Engineering - [K2A_U16] 3. can assess the utility of routine methods and tools for solving simple engineering tasks - [K2A_U17]		

<b>Social competencies:</b>
1. . can make use of analytic, simulation and experimental methods to formulate and solve engineering tasks - [K2A_K1]
2. can come up with a suggestion how to make use of state-of-the art technoogy (techniques and technology) within products design - [K2A_K3]
3. can discern dependencies of causal incidents in the process of achieving set goals and rank the pertinence of alternative or competitive tasks - [K2A_K4]

<b>Assessment methods of study outcomes</b>
Project
Practicals

<b>Course description</b>
Design definitions, The need to design, Stages of design, Guidance for the design, Characteristics of design process, Design errors, Role and characteristics of a designer, Chapter exercises, Products and their features, What is a product, Phases of a products? lifecycle, Constructive criterion of products, Groups of users in the process of design, The product from the point of view of design, Selected marketing features of products, Methods in design, Historical methods for design, Systematic methods of design, Value analysis, ARZW Algorithm of solving inventive tasks, Collaborative Strategy for Adaptable Architecture, Systems engineering, Page?s cumulative strategy, Limited search, Design of systems man- technical object, Descriptively exploratory methods of design, Study of the users? behavious, Setting an objective, Collection and data reduction. Questionnaires and survey interview, System testing, Detecting visual inadequacies, Methods structuralizing a project problem, AIDA Analysis of Interconnected Decision Area, Functional innovation, Innovation through boundaries modification, Classification of data useful in design, Matrix interaction, System transformation, Exploratory methods of design, Brainstorm, Altszuler and Flowmaker?s inventive tricks, Cards and morphological analysis, Scamper, Synthesis, Evaluative methods of design, Choice of criteria, Personae in the design, Design tools, The need for design tools, computer-related design tools.

<b>Basic bibliography:</b>
1. Butlewski M., Projektowanie i ocena wyrobów - wybrane zagadnienia (Design and products evaluation- selected problems), Politechnika Poznańska 2012
2. Altszuller H., Algorytm wynalazku (Algorithm of an invention), Wiedza Powszechna, Warszawa 1972.

<b>Additional bibliography:</b>
1. Gasparski W., Projektowanie - koncepcyjne przygotowanie działań (Design and conceptual preparation of activities). PWN, Warszawa, 1978

<b>Result of average student's workload</b>	
<b>Activity</b>	<b>Time (working hours)</b>
1. lecture	15
2. practicals	30
3. project	15
4. individual work	15

<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	75	5
Contact hours	60	3
Practical activities	45	2