STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Ergonomics in Design		**1011101251011100238**

Field of study	Profile of study (general academic, practical)	Year /Semester
Engineering Management - Full-time studies -	**(brak)**	**3 / 5**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**elective**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**full-time**

No. of hours				No. of credits
Lecture: **15**	Classes: **15**	Laboratory: **-**	Project/seminars: **-**	**4**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**4 100%**
Technical sciences	**4 100%**

Responsible for subject / lecturer:

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Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of ergonomics
2	**Skills**	Analysis of the interdisciplinary problems
3	**Social competencies**	The ability to work in a group and think independently

Assumptions and objectives of the course:

-The aim of the course is to familiarize students with the basic concepts of methodology design oriented to a person as an operator and a technician of a machine services and other technical equipment. The aim is to provide the students with the design skills regarding systems man - technical object in the practical project work connected with specific, detailed design tasks defined from an anthropocentric point of view.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Has a basic knowledge of the life cycle of machinery and equipment - - [[K1A_W21]]
2. Has a basic knowledge of the life cycle of socio-technical systems - - [[K1A_W23]]
3. Knows the basic methods, techniques, tools and materials used in solving simple engineering tasks in the construction and operation of machinery - - [[K1A_W24]]
4. Has the basic knowledge necessary to understand the determinants of non-technical engineering activities; knows the basic rules of safety and health at work force in the industry - - [[K1A_W25]]
5. Knows the typical industrial technology and knows how in details the construction technology and operation of machinery - - [[K1A_W27]]

Skills:

1. Can use to formulate and solve engineering tasks analytical, simulation and experimental methods- - [[K1A_U13]]

2. Can while formulating and solving engineering tasks, see their systemic, socio-technical, organizational, economic and non-technical aspects- - [[K1A_U14]]

3. Can make a preliminary economic analysis of the studied engineering activities - - [[K1A_U15]]

4. Is able to identify the project tasks and solve simple design tasks within the construction and operation of machinery - - [[K1A_U17]]

5. Can use the typical method of solving simple problems involving the construction and operation of machinery - - [[K1A_U18]]

6. Can design a simple construction and technology of simple machinery parts and components as well as design the organization of the production units of the first complexity degree - - [[K1A_U19]]

Social competencies:

1. . Is aware of and understands the importance and impact of non-technical aspects of engineering, including its impact on the environment, and the related responsibility for decisions - - [[K1A_K08]]

2. Is aware that the creation of products that meet the needs of users requires a systemic approach, including the technical concepts and other - - [[K1A_K09]]

Assessment methods of study outcomes

Lectures

-Formative assessment:

Credits will be given on the basis of an assignment and active participation in classes

-Collective assessment:

Written exam (test), at least 55% of the correct answers required.

Exercises: Assessment on the basis of: colloquium, active participation in classes.

Summary grade.

Course description

-Genesis of the design science and definitions. The designing system and the system designed. Engineering design: goals, objectives, structure of the process. Ergonomic design paradigm. The human-technical object system as a subject of design, decision criteria, the structure of the ergonomic design process. Designing the process of work, the work space, information and control processes, sources of occupational environment - practical examples. The economic and social benefits of ergonomic design. Computer-aided design and heuristic improvements for design. Designing for people with disabilities.

Basic bibliography:

1. Projektowanie ergonomiczne (Ergonomic design); Edwin Tytyk, Wyd. Naukowe PWN, Warszawa-Poznań, 2001

2. Ergonomia produktu. Ergonomiczne zasady projektowania produktów (Product ergonomics. Ergonomic design principles of the product; Jan Jabłoński (red.), Wydawnictwo Politechniki Poznańskiej, Poznań, 2006

3. Projektoznawstwo (Project work); Wojciech Gasparski (red.), WNT, Warszawa, 1988

4. Atlas miar człowieka. Dane do projektowania i oceny ergonomicznej (Atlas of human measure. The data for the design and evaluation of ergonomic evaluation); Adam Gedliczka, Wyd. CIOP, Warszawa, 2001

5. Ewa Górska, Edwin Tytyk, Ergonomia w projektowaniu stanowisk pracy. Materiały pomocnicze do ćwiczeń projektowych (Ergonomics in the design of workplaces. Materials for design classes); Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 1998

6. Metodologiczne problemy projektowania ergonomicznego w budowie maszyn (Methodological problems of ergonomic design in mechanical engineering); Jerzy Słowikowski, Wyd. CIOP, Warszawa, 2000

7. Projektowanie ergonomiczne (Ergonomic design); Edwin Tytyk, Wyd. Naukowe PWN, Warszawa-Poznań, 2001

8. Ergonomia produktu. Ergonomiczne zasady projektowania produktów (Product ergonomics. Ergonomic design principles of the product; Jan Jabłoński (red.), Wydawnictwo Politechniki Poznańskiej, Poznań, 2006

9. Butlewski M., Projektowanie i ocena wyrobów. - Poznań: Wydaw. Politechniki Poznańskiej , 2013. - 106 s. ? podręcznik

10. Atlas miar człowieka. Dane do projektowania i oceny ergonomicznej (Atlas of human measure. The data for the design and evaluation of ergonomic evaluation); Adam Gedliczka, Wyd. CIOP, Warszawa, 2001

11. Ewa Górska, Edwin Tytyk, Ergonomia w projektowaniu stanowisk pracy. Materiały pomocnicze do ćwiczeń projektowych (Ergonomics in the design of workplaces. Materials for design classes); Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 1998

12. Metodologiczne problemy projektowania ergonomicznego w budowie maszyn (Methodological problems of ergonomic design in mechanical engineering); Jerzy Słowikowski, Wyd. CIOP, Warszawa, 2000

Additional bibliography:

1. Diagnozowanie środowiska pracy (Work environment diagnosing); Małgorzata Wejman, Wydawnictwo Politechniki Poznańskiej, Poznań, 2012

2. Makroergonomia (Macroergonomics); Leszek Pacholski, Aleksandra Jasiak, Wydawnictwo Politechniki Poznańskiej, Poznań, 2011

3. Podstawy ergonomii i fizjologii pracy (Fundamentals of ergonomics and work physiology); Jerzy Olszewski, Wydawnictwo Akademii Ekonomicznej, Poznań, 1997

4. Diagnozowanie środowiska pracy (Work environment diagnosing); Małgorzata Wejman, Wydawnictwo Politechniki Poznańskiej, Poznań, 2012

5. Makroergonomia (Macroergonomics); Leszek Pacholski, Aleksandra Jasiak, Wydawnictwo Politechniki Poznańskiej, Poznań, 2011

6. Zabłocki, M., Butlewski, M., Sydor, M. (2017). Ergonomiczne rozwiązania techniczne dla osób z niepełnosprawnościami stosowane w transporcie zbiorowym. Bezpieczeństwo Pracy ? Nauka i Praktyka, 553(10), 15?19.

7. Sydor, M., Zabłocki, M., Butlewski, M. (2017). Ergonomiczne wymagania stawiane pojazdom samochodowym dla osób z niepełnosprawnościami. Bezpieczeństwo Pracy ? Nauka i Praktyka, 553(10), 10?14.

8. Butlewski M., Misztal A., Belu N., An analysis of the benefits of Ethnography Design methods for product modeling, IOP Conf. Series: Materials Science and Engineering 145 (2016) 042023, IOP Publishing.

9. Kalemba A., Butlewski, M. (2016). ;Ergonomic design of store shelving for the elderly applying universal design with a focus on health and safety. Occupational Safety and Hygiene IV,.

10. Królak, P., Butlewski, M. (2016). Application of the TRIZ method in design oriented to the various needs of people with disabilities. Occupational Safety and Hygiene IV, 275.

11. Butlewski M., Unit package opening design for the elderly by applying the principles of universal design, Applied Mechanics and Materials, Vol. 809, pp. 1263-1268

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	15
2. Participation in classes	15
3. Preparation for classes	20
4. Consultations	20
5. Preparation for the test	28
6. Test	2

Student's workload

Source of workload	hours	ECTS
Total workload	100	4
Contact hours	52	2
Practical activities	48	2