



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Product Ergonomics

### Course

Field of study

Engineering Management

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/4

Profile of study

general academic

Course offered in

polish

Requirements

elective

### Number of hours

Lecture

15

Laboratory classes

Other (e.g. online)

Tutorials

15

Projects/seminars

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

dr hab. Eng. Marcin Butlewski

e-mail: marcin.butlewski@put.poznan.pl

Faculty of Engineering Management

ul. Jacka Rychlewskiego 2, 60-965 Poznań

Responsible for the course/lecturer:

Dr. Eng. Waldemar Prussak

e-mail: waldemar.prussak@put.poznan.pl

Faculty of Engineering Management

ul. Jacka Rychlewskiego 2, 60-965 Poznań

### Prerequisites

The student has basic knowledge in the field of ergonomics

### Course objective

The aim of the course is to provide practical skills in the ergonomic and design of products - better consideration of human needs in design solutions

### Course-related learning outcomes

Knowledge

has basic knowledge of the life cycle of industrial products and everyday use

knows the basic methods, techniques, tools and materials used to solve simple engineering tasks in the field of construction and operation of machines used in product design



knows typical industrial technologies and knows in depth the technologies of machine construction and operation in the context of product design

has the basic knowledge necessary to understand the non-technical determinants of engineering activities; knows the basic principles of ergonomics used in technology

#### Skills

can use to formulate and solve engineering tasks analytical, simulation and experimental methods to design an ergonomic product

can - when formulating and solving engineering tasks - designing products - notice their systemic, socio-technical, organizational, economic and non-technical aspects

can make a preliminary economic analysis of the engineering activities necessary to determine the feasibility of ergonomic solutions

can identify design tasks and solve simple design tasks in the field of product design

can apply typical methods for solving simple problems in the field of machine construction and operation, and product design

is able to design the construction and technology of simple parts and subassemblies of machines and everyday products

#### Social competences

is aware that creating products that meet the needs of users requires a systematic approach taking into account technical, economic, marketing, legal, organizational and economic issues, which allows obtaining products better suited to their users

is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment, and the associated responsibility for the decisions taken and their consequences for the product in various stages of its life

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:

- a) exercises: current assessment (on a scale of 2 to 5 points) of tasks ordered,
- b) lectures: answers to questions about the material discussed in previous lectures.

Summative rating:

- a) exercises: the final grade is the average of partial tasks; exercises passed after obtaining at least average 3.0,
- b) lectures: written colloquium from the content presented in the lecture (form: open and problem questions)



## Programme content

Product concept and product ergonomics. Criteria for assessing the product, including the industrial product. Ergonomic design. Laws and standards in ergonomic design. The tasks of product ergonomics: adapting technical objects to human dimensions and shapes, ensuring the functionality of a technical object (e.g. efficiency, suitability of form, function, reliability, susceptibility to repair regulations, ease of disposal after use), ensuring safety and comfort of using a technical object, eliminating negative the impact of the product on human environmental conditions, care for the aesthetics and colors of the technical object. Benefits of product ergonomics. Losses resulting from low ergonomics of technical facilities. Test methods and assessment of product ergonomics. Industrial ergonomics and design.

Exercises: the use of analyzes that allow achieving better ergonomic quality of the product, analysis of requirements, morphological analysis, home of quality for the purposes of an ergonomic product, ergonomic TRIZ.

## Teaching methods

Teaching methods:

Conversational lecture

exercises:

The classic problem method

Case method

The staging method

Idea exchange (brainstorming)

## Bibliography

Basic

Jabłoński J. (red.), Ergonomia produktu. Ergonomiczne zasady projektowania produktów, Wyd. Politechniki Poznańskiej, Poznań, 2006

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

Butlewski M., Heuristic Methods Aiding Ergonomic Design, Universal Access in Human-Computer Interaction. Design Methods, Tools, and Interaction Techniques for eInclusion, Lecture Notes in Computer Science Volume 8009, 2013, pp 13-20

Butlewski M., The issue of product safety in contemporary design. in: Safety of the system, Technical, organizational and human work safety determinants. Red. Szymon Salamon. Wyd. PCzęst. Częstochowa 2012. ISBN 978-83-63500-13-9, ISSN 1428-1600, pp. 112-120



Tytek E., Projektowanie ergonomiczne, Wydawnictwo Naukowe PWN, Warszawa, 2001

Butlewski M., Projektowanie ergonomiczne wobec dynamiki deficytu zasobów ludzkich / Marcin Butlewski (WIZ) / red. Krystyna Bubacz - Poznań, Polska : Wydawnictwo Politechniki Poznańskiej, 2018 - 255 s.

Additional

Butlewski M., Tytek E., Inżynieria ergonomiczna dla aktywizacji osób starszych, Praca i Zabezpieczenie Społeczne, 50 - 59

Butlewski, M., Jasiulewicz-Kaczmarek, M., Misztal, A., Sławińska, M., Design methods of reducing human error in practice, (2015) Safety and Reliability: Methodology and Applications - Proceedings of the European Safety and Reliability Conference, ESREL 2014, pp. 1101-1106.

Norman, D. (2013). The design of everyday things: Revised and expanded edition. Basic Books (AZ).

Norman, D. A. (2004). Emotional design: Why we love (or hate) everyday things. Basic Civitas Books.

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

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	60	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	30	1,0

<sup>1</sup> delete or add other activities as appropriate