



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Ergonomics and safety [S2MiBP1>EaB]

### Course

Field of study

Mechanical and Automotive Engineering

Year/Semester

2/3

Area of study (specialization)

Railway Vehicles

Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

1,00

### Coordinators

dr Jarosław Gabryelski

jaroslaw.gabryelski@put.poznan.pl

### Lecturers

### Prerequisites

Basic knowledge in the field of machine science, machine building, human sciences. The ability to think logically, use information obtained from the library, the Internet, standards, catalogs. Understanding the need to acquire transferred knowledge

### Course objective

Gaining knowledge on the importance and use of ergonomics in professional activity

### Course-related learning outcomes

Knowledge:

Has knowledge of the principles of safety and ergonomics in the design and operation of machines and the threats that machines pose to the natural environment.

Has extended knowledge of the life cycle of machines, the principles of operation of working machines and destructive processes occurring during operation, such as tribological wear, corrosion, surface fatigue and volumetric aging of the material.

Is aware of the civilization effects of technology.

### Skills:

He can estimate the potential threats to the environment and people from the designed working machine and vehicle from a selected group.

He can develop a technical description, offer and design documentation for a complex machine from a selected group of machines.

Can communicate on specialist topics with a diverse audience.

### Social competences:

He is ready to critically assess his knowledge and received content.

It is ready to fulfill social obligations, inspire and organize activities for the benefit of the social environment.

It is ready to initiate actions for the public interest.

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Passing the course on the basis of a test

## Programme content

Basic concepts, the genesis of ergonomics as a scientific discipline, legal protection of human; Place of ergonomic design in the methodology of technical design in machine building (requirements in the process of technical design) Anthropotechnical and social engineering system, somatic and receptor relations in the system; Analysis of anthropometric, biomechanical and psychological features and support of design work in ergonomics: traditional approach and the use of CAD systems, Motion Capture devices or 3D scanning. .: ergonomics for the elderly, ergonomics of extreme work, ergonomics of free time and sports (design criteria, requirements, standardization); Examples of knowledge integration in ergonomic design: typography and its importance for the design of signaling and control devices; construction and applied canons of the human body; designing forms of technical objects with the use of real research of somatic and receptor features of the human body; Development trends of design for the needs of ergonomics

## Course topics

Basic concepts, the genesis of ergonomics as a scientific discipline, legal protection of human; Place of ergonomic design in the methodology of technical design in machine building (requirements in the process of technical design) Anthropotechnical and social engineering system, somatic and receptor relations in the system; Analysis of anthropometric, biomechanical and psychological features and support of design work in ergonomics: traditional approach and the use of CAD systems, Motion Capture devices or 3D scanning. .: ergonomics for the elderly, ergonomics of extreme work, ergonomics of free time and sports (design criteria, requirements, standardization); Examples of knowledge integration in ergonomic design: typography and its importance for the design of signaling and control devices; construction and applied canons of the human body; designing forms of technical objects with the use of real research of somatic and receptor features of the human body; Development trends of design for the needs of ergonomics

## Teaching methods

informative lecture (conventional with practical examples of the application of the discussed methods and conversational elements)

## Bibliography

### Basic

1. Górska E .: Ergonomia, Wyd. Warsaw University of Technology, Warsaw 2002.
2. Product ergonomics. Ergonomic principles of designing industrial products, collective work edited by J. Jabłoński, Poznań University of Technology Publishing House, Poznań 2006.
3. Pacholski, L .: Ergonomics, Poznań University of Technology Publishing House, Poznań 1986.
4. Tytyk E .: Ergonomic Design, PWN Scientific Publishing House, Warsaw-Poznań 2001.

### Additional

1. Słowikowski J .: Methodological problems of ergonomic design in machine building, Wydawnictwo Centralny Instytut Ochrony Pracy, Warsaw 2000.
2. Winkler T .: Computer-aided design of anthropotechnical systems, WNT, Warsaw, 2005.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50