



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Ergonomics in Transport [N2Trans1>EwT]

### Course

Field of study

Transport

Year/Semester

1/2

Area of study (specialization)

Road Transport

Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

### Number of hours

Lecture

18

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

1,00

### Coordinators

dr Jarosław Gabryelski

jaroslaw.gabryelski@put.poznan.pl

### Lecturers

### Prerequisites

Knowledge: basic knowledge from the field of technique; science about man; Skills: logical thinking, utilisation of information acquired from the library, Internet, standards, catalogues; Social competences: understanding the need of acquiring transferred knowledge;

### Course objective

Gaining knowledge on the subject: significance of ergonomics in the activities of engineers; designing technical objects in transport with special attention being paid to somatic and receptor relations in the system man - technical object;

### Course-related learning outcomes

Knowledge:

Student has advanced detailed knowledge on selected issues in the field of transport engineering

Student has knowledge of development trends and the most important new achievements of means of transport and other selected related scientific disciplines

Skills:

Student is able - when formulating and solving engineering tasks- to integrate knowledge from various areas of transport (and, if necessary, knowledge from other scientific disciplines) and apply a systemic approach, also taking into account non-technical aspects  
Student is able to make a critical analysis of existing technical solutions and propose their improvements (improvements)  
Student is able - in accordance with a given specification, taking into account non-technical aspects - design a complex device, system in the field of transport engineering or a process and implement this project - at least in part - using appropriate methods, techniques and tools, including adapting the existing or developing new tools

Social competences:

Student understands that in the field of transport engineering, knowledge and skills very quickly become obsolete

Student understands the importance of using the latest knowledge in the field of transport engineering in solving research and practical problems

Student understands the importance of popularizing the latest achievements in the field of transport engineering

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Credit based on the assessment of design tasks performed in groups

### Programme content

Basic concepts: origin of ergonomics as a scientific discipline, legal protection of man; the system of man – work – environment; corrective and creative ergonomics of adjustment of the work environment to man;

Methodology of ergonomic evaluation of technical projects; somatic and receptor relationships and hazards in the anthropotechnical system;

Physiology of physical effort in ergonomics; anthropometric and biomechanical investigations of man and their computer modelling;

Work environment and hazards in machine construction (including: lighting, noise and microclimate); basics of designing of work-stands, e.g. work-station for a driver, computer station;

Requirements and criteria of ergonomics and labour safety; possibilities of ergonomic computer systems as exemplified by the system: a driver -personal car; reproduction of man's collision; reaching out with limbs and limb ranges; investigation of the correctness of distribution of comfort zones in an anthropotechnical system;

Ergonomic form shaping of technical objects on selected examples from the field of transport;

Selected contemporary directions of development of ergonomics: e.g.: designing means of mobility for persons with motor disabilities; specific examples of the application of ergonomics in transport;

Detailed principles of product ergonomic designing in transport.

### Course topics

Basic concepts: origin of ergonomics as a scientific discipline, legal protection of man; the system of man – work – environment; corrective and creative ergonomics of adjustment of the work environment to man;

Methodology of ergonomic evaluation of technical projects; somatic and receptor relationships and hazards in the anthropotechnical system;

Physiology of physical effort in ergonomics; anthropometric and biomechanical investigations of man and their computer modelling;

Work environment and hazards in machine construction (including: lighting, noise and microclimate); basics of designing of work-stands, e.g. work-station for a driver, computer station;

Requirements and criteria of ergonomics and labour safety; possibilities of ergonomic computer systems as exemplified by the system: a driver -personal car; reproduction of man's collision; reaching out with limbs and limb ranges; investigation of the correctness of distribution of comfort zones in an anthropotechnical system;

Ergonomic form shaping of technical objects on selected examples from the field of transport;

Selected contemporary directions of development of ergonomics: e.g.: designing means of mobility for persons with motor disabilities; specific examples of the application of ergonomics in transport; Detailed principles of product ergonomic designing in transport.

### Teaching methods

Lecture with a multimedia presentation (a form of an information lecture with elements of a problem-based and conversational lecture)

### Bibliography

#### Basic

1. Górka E.: Ergonomia, Wyd. Politechniki Warszawskiej, W-wa 2002
2. Ergonomia produktu. Ergonomiczne zasady projektowania produktów przemysłowych, praca zbiorowa pod redakcją J. Jabłońskiego, Wydawnictwo Politechniki Poznańskiej, Poznań 2006
3. Pacholski, L.: Ergonomia, Wydawnictwo Politechniki Poznańskiej, Poznań 1986
4. Tytyk E.: Projektowanie ergonomiczne, Wydawnictwo Naukowe PWN, Warszawa-Poznań 2001
5. Atlas miar człowieka, red. A. Gedliczka, Wyd. CIOP, Warszawa 2001

#### Additional

1. Słowikowski J.: Metodologiczne problemy projektowania ergonomicznego w budowie maszyn, Wydawnictwo Centralny Instytut Ochrony Pracy, Warszawa 2000
2. Winkler T.: Komputerowo wspomaganie projektowanie systemów antropotechnicznych, WNT, Warszawa, 2005
3. Cooper R.: Rehabilitation Engineering Applied to Mobility and Manipulation, Institute of Physics Publishing Bristol and Philadelphia, Bristol 1995

### Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,00
Classes requiring direct contact with the teacher	18	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	12	0,50