



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Ergonomics in machine design [N1MiBP1>EwBM]

Course

Field of study

Mechanical and Automotive Engineering

Year/Semester

1/2

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

9

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

1,00

Coordinators

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Lecturers

dr Jarosław Gabryelski

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Prerequisites

Knowledge: basic knowledge from the field of technique; 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; importance of taking into consideration of somatic and receptor relations in the system man - technical object during the process of machine construction;

Course-related learning outcomes

Knowledge:

Has elementary knowledge of the impact of technology changes on the organization of social life as well as the health and psyche of individuals in human-machine contact.

Is aware of the latest trends in machine construction, i.e. automation and mechatronization, automation of machine design and construction processes, increased safety and comfort of operation, the use of modern construction materials.

Has basic knowledge of the strength of materials, including the basics of the theory of elasticity and plasticity, stress hypotheses, calculation methods for beams, membranes, shafts, joints and other simple structural elements, as well as methods of testing the strength of materials and the state of deformation and stress in mechanical structures.

Skills:

Can obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions.

Can competently advise on the selection of a machine for a given application in the industry covered by the selected diploma path based on the acquired knowledge about a given group of machines.

Can prepare a technical descriptive and drawing documentation of an engineering task.

Has the ability to self-educate with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books.

Social competences:

Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on his own.

Is ready to fulfill social obligations and co-organize activities for the benefit of the social environment.

Is ready to fulfill professional roles responsibly, including: - observing the rules of professional ethics and requiring this from others, - caring for the achievements and traditions of the profession.

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. computer stations;

Requirements and criteria of ergonomics and labour safety; possibilities of ergonomic computer systems; reproduction of man's collision; reaching out with limbs and limb ranges in an anthropotechnical system on the basis of selected examples in machine construction;

Ergonomic form shaping of technical objects (principles of designing tools, processing stations, furniture etc.);

Detailed principles of product ergonomic designing in machine construction.

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. Górska 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

Additional

1. Słowikowski J.: Metodologiczne problemy projektowania ergonomicznego w budowie maszyn, Wydawnictwo Centralny Instytut Ochrony Pracy, Warszawa 2000

2. Hempel L.: Człowiek i maszyna model techniczny współdziałania, WKŁ, Warszawa 1984

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	9	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	16	0,50