

FACULTY OF COMPUTER SCIENCE AND MANAGEMENT**SUBJECT CARD****Name in Polish ...Fizyka Środowiska Pracy****Name in English Work Environment Physics****Main field of study (if applicable): Management****Specialization (if applicable): Organizational Management****Level and form of studies: 1st level, full-time****Kind of subject: obligatory****Subject code FZZ2503****Group of courses NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30	15	15		
Number of hours of total student workload (CNPS)	60	30	30		
Form of crediting	crediting with grade	crediting with grade	crediting with grade		
For group of courses mark (X) final course					
Number of ECTS points	2	1	1		
including number of ECTS points for practical (P) classes		1	1		
including number of ECTS points for direct teacher-student contact (BK) classes	1	0,5	0,5		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic statistical and mathematical skills (maturity exam or higher)
- 2.
- 3.

SUBJECT OBJECTIVES

C1 Possessing the basic knowledge about parameters of work environment and the work designing with taking into consideration ergonomics rules.

C2: Ability of work organization with taking into consideration ergonomics rules.

C2.1: optimization of work conditions for effective physical and psychological work

C2.2: preventing the harmful physical factors in the form of barriers and the organization of work, in order to maintain optimal conditions for effective physical and mental activity

C3: Acquisition and consolidation of social skills involving the ability to work in a group of students. The training of work habits according to the principles of ergonomics.

SUBJECT EDUCATIONAL EFFECTS

The scope of knowledge: basic knowledge about physics, ergonomics and safety.

PEK_W01: knowing the basic principles of physics with emphasis on the work environment factors, knowing the effects of some environmental factors on the human body work and workload

PEK_W02: knowing the basic ergonomic principles, tools and methods for the assessment of workload and the legal and normative basis for occupational safety and ergonomics

The scope of skills: able to organize work in accordance with the principles of ergonomics and safety at work, taking into account the physical factors of the work environment

PEK_U01: assessment the prevailing workload type and applying the basic methods of ergonomics

PEK_U02: determining the legal and standard conditions of environment factors and ergonomics in Poland and the European Union on the basis of relevant documents

The scope of social competence: Acquisition and consolidation of competence involving the ability to cooperate in a group of students. Education work habits with regard to ergonomic principles.

PEK_K01: development the skills of team cooperation to the optimal solution of problems assigned

PEK_K02: preparation to build the capacity of self-determination, decision making and their implementation in the enterprise.

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec 1	Introduction. Work environment and work environment physics - definition. Ergonomics - the history, aims and objectives, methods of ergonomic	4
Lec 2	Human being in the work environment. Directive 89/391/EEC (minimal requirements for work safety and ergonomics). The reliability of worker. Human-machine-work environment system. Fundamentals of ergonomic design.	4
Lec 3	Work environment factors and their impact on human productivity. Microclimate - basic concepts, the impact on the human body. Physical parameters of microclimate.	4
Lec 4	Lighting. Eyesight and eye anatomy. Basic lighting and illumination parameters affecting the employee. The impact of lighting on worker productivity.	4
Lec 5	Sound - the basic physical parameters. Noise. Structure and function of the organ of hearing. The impact of noise on humans. Prevention of noise.	4
Lec 6	Workspace of man. Variability of human anthropometric measurements. Recommendations for ergonomic work space design. Layout of workstation elements. Posture at work. Factors determining the awkward postures. The consequences of awkward posture.	4
Lec 7	Working at the computer workstation. The recommended posture. Workspace organization. Requirements and recommendations for computer workstation. Signal and steering devices. The basic	4

	principles of human-computer interaction	
Lec 8	Psychological stress and biomechanical workload. Methods for evaluation of workload and workload reduction	2
	Total hours	30
Form of classes - class		Number of hours
Cl 1	The physical characteristics of the working environment - microclimate, thermal comfort, thermal stress analysis	2
Cl 2	The physical characteristics of the work environment - noise and vibration - Evaluation of the workload.	2
Cl 3	The physical characteristics of the work environment - lighting - impact on human eyesight and body.	2
Cl 4	Energy and postural workload at different workstations	2
Cl 5	The layout of the workstation - anthropometry and optimization	2
Cl 6	Computer workstation. Analysis and Design	2
Cl 7	Human-computer interaction - the analysis and design	3
	Total hours	15
Form of classes - laboratory		Number of hours
Lab 1	Microclimate - computer simulation of thermal effects on the human environment	2
Lab 2	Designing a computer workstation - computer analysis of the geometric parameters of the workstation computer.	2
Lab 3	Lighting - Lighting Design Simulation in the workplace.	3
Lab 4	The design of layout of work elements.	2
Lab 5	Biomechanical workload - methods for assessing	2
Lab 6	Human - computer interaction. Laboratory testing of the man – machine system	2
	Total hours	15
Form of classes - project		Number of hours
Proj 1		
Proj 2		
Proj 3		
	Total hours	
Form of classes - seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
	Total hours	
TEACHING TOOLS USED		
N1. Traditional lecture with multimedia presentation		
N2. Laboratory - computer software, specialized research stations constructed in the Laboratory of Ergonomics		
N3. Working in groups during the lecture and classes		
N4. Self-presentation of the prepared material during classes		

N5. Tutorial

N6. Self access - independent studies, preparing a presentation for classes

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end))	Educational effect number	Way of evaluating educational effect achievement
F1	PEK_W01 – PEK_W02 PEK_U01 - PEK_U02 PEK_K01 – PEK_K02	Activity during lectures, classes and laboratories Group work during lectures and classes Short tests Self-prepared presentation Laboratory exercises conducting
F2	PEK_W01 – PEK_W02 PEK_U01 - PEK_U02	Written test for crediting with grade

P=F2

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

- [1] Course material available at www.ergonomia.ioz.pwr.wroc.pl
- [2] Guastello S.G., Human factors engineering and ergonomics : a systems approach. Lawrence Erlbaum Associates, 2006.
- [3] Kroemer, Karl H. E., Ergonomics: how to design for ease and efficiency, Prentice Hall, 2001
- [4] Norman D., The design of everyday things, Currency and Doubleday, 1990
- [5] Salvendy, Gavriel (ed), Handbook of Human Factors and Ergonomics, John Wiley & Sons, 2006; electronic access

SECONDARY LITERATURE:

- [1] Human-computer interaction: design issues, solutions, and applications / ed. by Andrew Sears, Julie A. Jacko. CRC Press/Taylor & Francis Group, 2009
- [2] Grobelny J., Jach K., Ergonomics and usability of information systems. in: Ergonomics and work safety in information community. Education and researches. Eds Leszek M. Pacholski, Jerzy S. Marcinkowski, Wiesława M. Horst. Poznań : Institute of Management Engineering. Poznan University of Technology, 2005
- [3] Nowak E., Atlas antropometryczny populacji polskiej - dane do projektowania. The Anthropometric Atlas of Polish Population - Data for Design, IWP Warszawa, 2001
- [4] Proctor R.W., van Zandt T., Human factors in simple and complex systems, Allyn and Bacon, 1994
- [5] Torma-Krajewski, Janet ; Steiner, Lisa J.; Burgess-Limerick, Robin, Ergonomics Processes - Implementation Guide and Tools for the Mining Industry, U.S. Department of Health and Human Services, CDC/NIOSH Office of Mine Safety and Health Research (electronic access)

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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**MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
WORK ENVIRONMENT PHYSICS
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY MANAGEMENT
AND SPECIALIZATION **Organizational Management****

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)**	Subject objectives***	Programme content***	Teaching tool number***
PEK_W01	K1_ZARZ_W22 S1_ZARZ_OM_W07	C1	Lec1-Lec8; C1-C6; La1-La5	N1 – N6
PEK_W02	K1_ZARZ_W04 K1_ZARZ_W06 K1_ZARZ_W22	C2	Lec1-Lec8; C1-C7; La1-La7	N1 – N6
PEK_U01	K1_ZARZ_U13 S1_ZARZ_OM_U05 S1_ZARZ_OM_U07	C2.1	Lec1-Lec8; C1-C7; La1-La7	N1 – N6
PEK_U02	K1_ZARZ_U06 K1_ZARZ_U15	C2.2	Lec1-Lec8; C1-C7; La1-La7	N1 – N6
PEK_K01	K1_ZARZ_K02	C3	C1-C7; La1-La7	N1 – N6
PEK_K02	K1_ZARZ_K04	C3	Lec1 – Lec8; C1-C7; La1-La6	N1 – N6

** - enter symbols for main-field-of-study/specialization educational effects

*** - from table above