

POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA	SUBJECT DESCRIPTION	MODELO PED.013.03
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Course	Equipment Design					
Subject	Ergonomics and Anthropometricss					
Academic year	2023-2024	Curricular year	2nd	Study period	1st semester	
Type of subject	Compulsory	Student workload (H)	Total: 140	Contact: 60	ECTS	5
Professor(s)	Luís Miguel Lopes Lourenço, PhD					
<input checked="" type="checkbox"/> Area/Group Coordinator <input type="checkbox"/> Head of Department	(select)	José Reinas dos Santos André, PhD				

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

GENERAL OBJECTIVES:

Learn basic principles and techniques of ergonomics to improve the safety, the comfort, and the efficiency of human tasks.

SPECIFIC OBJECTIVES:

Identify and validate the man-environment on human tasks.

Confront product conception and work systems methods according to user friendly concept.

Propose solutions to improve efficiency and working conditions.

2. PROGRAMME

I. Introduction to ergonomics

Ergonomics concepts and fields of action.

Ergonomics development.

II. Basic concepts about the human body

The nervous system, muscles and spine anatomy, basic body mechanics.

Human metabolism, human senses.

Basic concepts of cognitive ergonomics.

III. Anthropometrical theory and applications

The statistical description of human variability.

Anthropometric measurements.

Anthropometric data and applications.

Models of the human body.

Human Factors and Ergonomic Applications (human tasks - product development).

IV. Biomechanical factors

Static and dynamic work and human tasks relationship.

Body working postures, manual material handling.

Lifting and carrying out of loads.

Ergonomics of seating.

V. Fundamentals of physical environment

Lighting. Characterization, evaluation parameters, lighting requirements, the use of color in ergonomics.

Thermal comfort. Characterization, evaluation parameters, human thermal requirements.

Sound and Noise. Effects, characterization, evaluation parameters, noise control - materials and technics.

VI. Product design ergonomics

Integrating ergonomics into the product/equipment development process.

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3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

To improve the safety, comfort and efficiency of the human tasks and products handling it becomes necessary to know, even basically, the characteristics, capabilities, and limitations of the users (anatomy and physiology of the human body). The programme content includes those factors and evaluates their interconnection with human activities that require particular conditions, such as space requirements (anthropometry), manual material handling (biomechanics), lighting requirements (vision), etc.

4. MAIN BIBLIOGRAPHY

Compulsory

Mccormick, E.; Sanders, M. (1993). *Human Factors in Engineering and Design*. New York: MacGraw Hill.

Kroemer, K. E. (2017). *Fitting the Human. Introduction to Ergonomics / Human Factors Engineering, 7th Edition*, CRC Press.

Panero, J. & Zelnik, M. (2002). *Las Dimensiones Humanas en los Espacios Interiores*. Barcelona: Gulstavo G. Gili.

Pheasant, S. (2003). *Bodyspace, Anthropometry, Ergonomics and the Design of Work*. Taylor & Francis.

Lourenço, L. M. (2008). *Apontamentos de Ergonomia*. Guarda: ESTG-IPG.

Recommended

Kroemer, K. E., Kroemer, H., Kroemer A. (2018). *Ergonomics: How to Design for Ease and Efficiency, 3rd Edition*. Academic Press.

Baxter, M. (1998). *Projeto de produto: guia prático para o projeto de novos produtos*. São Paulo: Edgard Blucher.

Karwowski, W.; Stanton, N. (2011). *Human Factors and Ergonomics in Consumer Product Design. Vol.1 - Methods and Techniques*. Taylor & Francis.

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Methodologies

Expositive and Interrogative Methods; practical case study exercises; tutorial sessions to support the lecture programme.

Evaluation

Evaluation= Written test A (50%) + Written test B (50%).

Or exam (100%), consisting of a single written test (encompassing the whole subject contents) with theoretical and practical-theoretical issues.

Minimum mean grade requirements: 10 (ten) values.

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

The expositive and interrogative methods supported by slides projection, the analysis of study cases of several human tasks involving spaces, tools, body movements, etc., and the resolution of practical exercises, together ensure that the contents of lecture are assimilated by the students. The analysis of study cases and the practical exercises are for showing the necessity to adapt the work to the human being.

7. ATTENDANCE

Attendance should be 50% of provided lessons, minimum. On the other hand, this item has no meaning to the exam.

8. CONTACTS AND OFFICE HOURS

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Professor: Luís Miguel Lopes Lourenço (PhD), mlopes@ipg.pt; office n.º 67. Office Hours: Monday 16:00-17:30; Wednesday 16:00-17:30; Friday 10:00-11:00 and 16:00-17:00.

Area Coordinator: José Reinas dos Santos André (PhD), jandre@ipg.pt; office n.º 13.

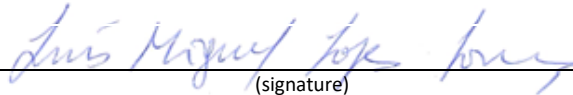
DATE

29 de setembro de 2023


SIGNATURES

Professor(s), Area/Group Coordinator or Head of Department signatures


Professor


(signature)


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