ISEL
ADEM
Área Departamental de Engenharia Mecânica

Ficha de Unidade Curricular (FUC)

Curso:	**MESTRADO EM ENGENHARIA E GESTÃO INDUSTRIAL**					
Unidade Curricular	**Work Design**			Obrigatória		
				Opcional	**X**	
Área Científica:	**Industrial Engineering and Management**					
Ano: **1º**	Semestre: **2º**	ECTS: **5**		Total de Horas: **135**		
Horas de Contacto:	T:	TP: **45**	PL:	S:	OT:	TT:
Professor Responsável		Grau/Título		Categoria		
Pedro D. B. Carmona Marques		**Doutor**		**Professor Adjunto**		

T- Teórica; TP – Teórico-prática; PL – Prática Laboratorial; S – Seminário; OT – Orientação Tutorial; TT – Total de horas de Contacto

Entrada em Vigor	Semestre: Verão	Ano Letivo: 2020/21

Objetivos da unidade curricular e competências a desenvolver (max. 1000 caracteres)

At the end of the course students should be able to achieve the following objectives:

O1 - Explain worker-machine systems, work standardization and measurement.

O2 - Identify different types of patterns explaining their benefits.

O3 - Apply relevant work standardization techniques and suggest their measurement to improve standards.

O4 - Present relevant work standards and measures for use in the workplace.

Conteúdos programáticos (max. 1000 caracteres)

CP1 - Introduction to work design

Nature of work, definition of work, types of occupation, importance of productivity

CP2 - Manual work and worker-machine systems

Manual work systems, worker-machine systems, automated work systems, determination of worker and machine requirements, machine clusters

CP3 - Methods, data collection and analysis techniques

Evolution and application of method engineering, analysis and data collection techniques, methods and automation

CP4 - Study of movements

Analysis of work and elements of movement, principles of economics of movement and work design

CP5 - Measurement of work and determination of standard times

Standard times and their determination, prerequisites for validating standard times, precision and application of the speed rate in work design, study of direct time, application software

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CP6 - Predetermined movement time, method-time measurement (MTM), Maynard sequence of operations technique (MOST)

CP7 - Work sampling

Standard data systems, work sampling operation, work sampling statistics, standard time and time study applications

CP8 - Ergonomics and human factors

Introduction to ergonomics, man-machine systems, areas of focus on ergonomics, physical ergonomics

Demonstração da coerência dos conteúdos programáticos com os objetivos da unidade curricular (max. 1000 caracteres)

The items of the syllabus (CP) correspond to the skills to be developed referred to in the objectives of the course.

O1. Explain worker-machine systems, standardization and work measurement - all items

O2. Identify different types of patterns explaining their benefits - items CP3, CP4 and CP5

Objective 3. Apply relevant work standardization techniques and suggest their measurement to improve standards - items CP5, CP6 and CP7

Objective 4. Present relevant work standards and measures for use in the workplace - all items

Metodologias de ensino (avaliação incluída) (max. 1000 caracteres)

This curricular unit will use lectures in the classroom to transmit its theoretical concepts, the resolution of practical exercises and the discussion of case studies. Practical work will promote the connection between the programmatic contents transmitted, as well as communication and group work.

Assessment: Practical work pedagogically fundamental (40%) and Final Exam (60%). In each of the assessments the minimum classification is 10 points (scale 0 to 20 points).

Demonstração da coerência das metodologias de ensino com os objetivos da unidade curricular (max. 3000 caracteres)

The established teaching methodologies will help students to achieve the proposed learning outcomes, thus promoting, among others, reasoning, critical thinking, clarifying doubts and deepening the transmitted knowledge.

Bibliografia Principal (max. 1000 caracteres)

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1. Andris Freivalds, Benjamin W. Niebel (2009). Niebel's methods, standards, and work design, McGraw-Hill Higher Education

2. Mikell P. Groover (2007). Work systems and the methods, measurement, and management of work, Pearson Prentice Hall

3. Frederick P. Morgeson, Michael T. Brannick, Edward L. Levine (2020). Job and Work Analysis: Methods, Research, and Applications for Human Resource Management, Sage