

Curricular Unit Form (FUC)

Course:	FIRST CYCLE IN MECHANICAL ENGINEERING					
Curricular Unit (UC)	Ergonomics				Mandatory	
					Optional	X
Scientific Area:	Mechanical Project, Manufacturing and Industrial Maintenance					
Year: 1º	Semester: 2º	ECTS: 5,0		Total Hours: 3,0		
Contact Hours:	T:	TP: 45	PL:	S:	OT:	TT:
Professor in charge		Academic Degree /Title		Position		
Inês de Carvalho Jerónimo		PhD		Assistant Professor		

T- Theoretical ; TP – Theory and practice ; PL – Laboratory ; S – Seminar ; OT –Tutorial ; TT – Total of contact hours

Entry into Force	Semester: Winter	Academic Year: 2016/2017
------------------	-------------------------	---------------------------------

Objectives of the curricular unit and competences (max. 1000 characters)

The aim of the Ergonomics course is to provide students with a set of knowledge and methodologies that allow them to understand the impact that good posture practices can have in a work environment as well as being able to design objects or equipment whose handling is studied to minimize injuries. The knowledge and methodologies are based on the theory of classical mechanics, experimental kinematic and dynamic measurement of movement and computational simulation as a tool to support clinical diagnosis, to the detection of nonconformities regarding postural comfort and the incidence of work injuries. The aim is to develop skills in qualitative and quantitative analysis of human movement, anthropometric characterization and static and / or dynamic analyses of systems in order to develop competencies in the area of ergonomics, applying the information obtained by the analyses and the regulatory norms of the application in question.

Syllabus (max. 1000 characters)

- 1 – Ergonomics principles, methods and techniques
- 2 – Human modelling – static and dynamic approaches
- 3 – Applied Anthropometry
- 4 – Workplace Environment – risks, assessments and controls
- 5 – Workplace Injury – assessment and prevention
- 6 – Product Handling – risks, assessments and controls
- 7 – Product Design – comfort and prevention of injury

Demonstration of the syllabus coherence with curricular unit's objectives (max. 1000 characters)

The fundamental concepts of the syllabus are introduced in class and are based on ergonomic analyses of biomechanical models of the human body, allowing students to perceive both the qualitative aspects and quantitative aspects of ergonomics, consistent with the objectives of the curricular unit.

Curricular Unit Form (FUC)

Teaching methodologies (including evaluation) (max. 1000 characters)

The teaching will be carried out through theoretical and practical lessons. It is intended that by reading the bibliography the student is introduced to each topic to discuss. More theoretical classes work with brief presentations on each theme, followed by practical examples, where the student is intended to consolidate the concepts studied. Theoretical and practical classes will be based on the resolution of exercises where students apply the knowledge acquired. In more complex cases or with greater graphics or mathematical demands will be made use of symbolic computation programs and computer simulation tools. The knowledge assessment is carried out in continuous assessment or final exam. The continuous assessment evaluation consists of a written test and a set of computational/laboratory work with contributions of 70% and 30%, respectively.

Demonstration of the teaching methodologies coherence with the curricular unit's objectives

(max. 3000 characters)

On the teaching methodologies are used different methodologies that make it possible to achieve the objectives of the curricular unit. Depending on the characteristics of the concepts to be transmitted, theoretical and practical classes are used, which constitute a set to be harmonious, in order to enable students to understand the fundamental concepts associated with the syllabus. In theoretical and practical classes the potential of new multimedia systems, symbolic computation software and computational simulation is used.

Main Bibliography (max. 1000 characters)

Bridger, R., "Introduction to Ergonomics", CRC Press, 3rd Edition, 2008. Pheasant S., Haslegrave. C.M., "Bodyspace: Anthropometry, Ergonomics and the Design of Work", CRC Press, 3rd Edition, 2005. Tillman, B., Fitts, D.J., Rose-Sundholm, R., Tillman, P., "Human Factors and Ergonomics Design Handbook", McGrawHill Education, 3rd Edition, 2016. Özkaya, N., Nordin, M., Goldsheyder, D., Leger, D., "Fundamentals of Biomechanics - Equilibrium, Motion, and Deformation", Springer, 3rd edition, 2012. Hall, S., "Basic Biomechanics", McGraw-Hill, 7th edition, 2015.