

69308 - Ergonomics and evaluation of functional capacity

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	547 - Master's in Biomedical Engineering
ECTS	3.0
Course	1
Period	Second semester
Subject Type	Optional
Module	---

1. Basic info

1.1. Recommendations to take this course

1.2. Activities and key dates for the course

2. Initiation

2.1. Learning outcomes that define the subject

2.2. Introduction

3. Context and competences

3.1. Goals

3.2. Context and meaning of the subject in the degree

3.3. Competences

3.4. Importance of learning outcomes

4. Evaluation

5. Activities and resources

5.1. General methodological presentation

The teaching methodology is structured in three levels: theoretical classes where the main subject contents are presented and discussed, student participation is encouraged; also computer lab sessions and development of practical tasks based on a real application or specific research activity are proposed.

5.2. Learning activities

The learning process designed for this subject it is based on the following activities:

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A01 Theoretical classes with the active involvement of the student (22 hours).

The main course contents are presented. This activity will take place in the classroom. It will feature audiovisual media to present practical cases and demonstrations of specific hardware and software used in this field. The participation of a forensic doctor of the Institute of Legal Medicine of Aragon is scheduled to impart a master class about functional capacity evaluation and legal medical procedures.

A03 Computer Lab practices . (4 hours).

Practices will be conducted in small groups of 2 or 3 students with specific hardware and software of application in ergonomic and Functional Capacity Evaluation assessments. It will be used motion capture systems based on wireless or optical sensors which are available in the biomechanics laboratory of I3A and in the Area of engineering project of EINA. These resources can be used later for the students in the development of their tasks.

A05 Development of practical tasks.

It should carry out practical work in groups of 2 students (Maximum 3).

Specifically, one of the application in the field of ergonomics work- product and the other one in the field of assessment of functional capacity.

To execute these work it will be used the valuation systems (software-hardware) used in the practices and available in laboratories and areas referred.

It must make a written report of assessment of each case studied, including literature review, case description, methods and procedures used, analysis of results and end conclusions.

These reports should be presented and defended orally.

A06: Tutorship.

Hours personalized attention to students with the aim of reviewing and discussing the topics presented in both theoretical and practical classes. Especially to support the execution of their practical tasks.

A08: Assessment.

The student will take an exam and several reports derived from the computer sessions and derived from the development of practical tasks will be evaluated.

5.3.Program

The program offered will help to achieve the expected results includes the following activities.

Ergonomics object. Ergonomics of work and product. Fields of application. Ergonomic methodology.

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Ergonomics, productivity and quality in the industry.

Musculoskeletal disorders (MSDs) of the workforce . Movements and postures. Musculoskeletal system. Location of MSDs. Ergonomic intervention.

Biomechanics and anthropometry . Skeletal model. Anatomical drawings, reference systems of the body segments and joint movements. Biomechanical models of different percentiles of man and woman. Anthropomorphic models.

Ergonomic analysis and evaluation based on simulation and 3D digital models. Motion capture application in ergonomic analysis systems.

Ergonomic analysis in products design .

Biomechanical analysis. Reference systems of the body segments. Angles, displacements, velocities and linear and angular accelerations. Specific software.

Postural load. REBA Method (Rapid Entire Body Assessment). Risk levels and intervention. Using specific software.

Lifting loads. NIOSH equation. Single-tasking and multitasking. Using specific software.

Evaluation of high-frequency repetitive upper limb movements . UNE-ENE-1005-52007. MoveHuman-FORCES method (UZ).

Functional Capacity Evaluation (FCE). Object and field of application.

Damage Valuation . Medical-legal and forensic implications.

Capacity assessment of the musculoskeletal system . Methodologies, procedures and interpretation of results.

Application of virtual reality systems in the field of ergonomics and Functional Capacity Assessment.

5.4.Planning and scheduling

The course calendar is defined by the Escuela de Ingeniería y Arquitectura calendar.

5.5.Bibliography and recommended resources

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