340263 - INPS-D7P32 - Human-System Interaction

Coordinating unit: 340 - EPSEVG - Vilanova i la Geltrú School of Engineering
Teaching unit: 732 - OE - Department of Management
Academic year: 2015
Degree: BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2009). (Teaching unit Optional)
ECTS credits: 6
Teaching languages: Catalan

Teaching staff
Coordinator: Ponsa Asensio, Pedro
Díaz Boladeras, Marta
Others: PERE PONSA ASENSIO
MARTA DÍAZ BOLADERAS

Opening hours
Timetable: Pere Ponsa: Tuesday, D-170, 17:00 to 19:00 PM

Requirements
Previously passed
MEDI Metodologia del disseny

And jointly with INPS we recommend:
ENUA Enginyeria de la usabilitat i l'accessibilitat
DIDU Disseny inclusiu i disseny centrat en l'usuari

Degree competences to which the subject contributes

Transversal:
1. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
2. ENTREPRENEURSHIP AND INNOVATION - Level 2. Taking initiatives that give rise to opportunities and to new products and solutions, doing so with a vision of process implementation and market understanding, and involving others in projects that have to be carried out.
3. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
4. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
5. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.
Teaching methodology

Presentation-synthesis

In the sessions the teacher makes a summary of the topic. This presentation is intended as a guide work study students, with the function of introducing the item, propose material for study, clarify doubts and synthesis.

Each topic will be provided with:
- Power Point presentations used in class and other supplementary material will be available on the Digital Campus.
- Bibliography indicating specific location, preferring to material in electronic format.

Working activities and exercises

- Problems and Exercises for fixing the concepts introduced in the presentation.
- Approach of situations that allow the group builds a shared experience that will serve to advance in the understanding of content (eg, group dynamics, effective communication experiences.) They are based on experience different situations in which the experience serves as a study material.

Casework and articles

The work on cases or article will be based on questions raised by the professor. These works must to be delivered on date at the beginning of the session where will be discussed in class. The deadline to submit is specified in calendar. The teacher may show in the Digital Campus some of the best works delivered to be used as a reference.

The casework seeks to promote the following capabilities:
- Understanding of the situation presented and the ability to synthesize the most relevant issues
- Apply the concepts to practical cases.
- Capturing the complexity of real life situations, different points of view and various dimensions of the organizational and management issues
- Ability to exchange views and discuss, and ability to learn from the debate

Projects
En this subject: projectone and projecttwo. Easch project can have a set of Practices

Projectes are held in groups of up to three members, to be established at the beginning of the course and will be maintained. Throughout the course there will be 2 projects that should be developed applying the knowledge acquired. These projects serve as the backbone of learning, following the principles of project-based learning. For each practice it will provided a dossier that shall include the objectives, description, date of delivery, and criteria assessment. Each practice will consist of a report and a presentation at pp.

Oral presentations

Each student will present oral argument at least once during the term. The days of presentation are announced at the beginning of the course. The day of the presentation the teacher a designate the groups that will carried out the presentation.

Small group and individual tutoring

The teacher will follow up the student progress and supervise their practices and work, providing feedback on their progress, the degree of achievement of the objectives of their work, giving directions for improvement.
Learning objectives of the subject

OBJECTIVES
1. Analysis requirements of users
2. Context of use
3. Application of universal design principles
4. Application of usability engineering methods and tools
5. Application of interface design techniques

RESULTS
1. Multidisciplinary project development
2. Guidelines design based on the user profile
3. Usability reports
4. Plan and development of evaluation test
5. Knowledge of international standards

Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 30h</th>
<th>20.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group: 15h</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Self study: 105h</td>
<td>70.00%</td>
</tr>
</tbody>
</table>
# Module 1 New interactive paradigms

**Learning time:** 32h  
- **Theory classes:** 8h  
- **Practical classes:** 0h  
- **Laboratory classes:** 6h  
- **Guided activities:** 0h  
- **Self study:** 18h

## Description:
Pere Ponsa

1.1 Definitions. Interaction. System. Interactive design  
1.4 Examples

## Related activities:
Examples and study cases where is established a relationship between ergonomics and design. Study case: the use of the Fitts Law in the design and evaluation of input devices. Study case: interacting with small interfaces and prototypes (Tablet PC, smartphones).

## Specific objectives:
Understand the role of people in complex systems  
Understand basic principles of interaction between humans and objects
Module 2 Interfaces and service for design

**Learning time:** 39h
- Theory classes: 10h
- Practical classes: 0h
- Laboratory classes: 8h
- Guided activities: 0h
- Self study: 21h

**Description:**
Pere Pponsa

2.1 Definition of interface
2.2 Kinect sensor
2.3 Leap Motion controller
2.4 SINA system
2.5 Multitouch tables
2.6 Services and user experience. aMIAlacance. Making life easier. Interactive experiences in the Museu del Ferrocarril
2.7 Small screen design. Guideline. Use of color and text. Architecture and navigation

**Related activities:**
- Relationship with (module 5)

**Specific objectives:**
- Establish the links between the design for services, the user experience and the design of interactive interfaces

Module 3 Interaction psychology and cognitive ergonomics

**Learning time:** 39h
- Theory classes: 10h
- Practical classes: 0h
- Laboratory classes: 8h
- Guided activities: 0h
- Self study: 21h

**Description:**
3.1 Perception
3.2 Cognition
3.3 Mental models and errors
3.4 Classic paradigm of the cognitive ergonomics
3.5 Joint cognitive system
3.6 Human error classification and design implications
3.7 Examples

**Related activities:**
- Study cases: air traffic controllers, human supervisory task in control room

**Specific objectives:**
- Know how the basic aspects of cognitive psychology can be useful in the interface design and the control of complex systems
Module 4 Emotional interaction

**Description:**

4.1 What are the emotions?
4.2 Where are the emotions?
4.3 Know, recognize and emotions measurement
4.4 Emotions and user experience
4.5 Emotional design
4.6 Affective computing and emotional interfaces
4.7 Anthropomorphism
4.8 Theoretical emotions models
4.9 Examples

**Related activities:**

Study cases: Kismet, robot AIBO, robot Pleo, avatar

**Specific objectives:**

Learn how improve the relationship between the product design, the user experience and the emotional design
Module 5 Project

Learning time: 14h
Theory classes: 14h

Description:
AL-.116 Interactive Systems Design Laboratory

Pere Ponsa. Project1. Design of interactive interfaces for the Museu del Ferrocarril (with the collaboration of Ana Grande)
Marta Díaz. Project2:

Related activities:

Rapport
Development of a CD multimedia
Oral presentation
Evaluation:
work in class: (20%)
Oral presentation (20)
final rapport (60%)

Specific objectives:
Performance evaluation
Re-design
Ergonomic assessment in the re-design

Qualification system

In the evaluation of the student will consider both the work done in groups such as the achievement of valued content individual written tests (tests). These exams will consist of a part of short questions or multiple choice, and another open questions or development. Students will also have a note obtained from the oral presentation practice, and assistance as and contributions in theoretical and practical.

NF = exam_1 * 0.2 + project1*0.3 + exam_2 * 0.2 + project * 0.3
Bibliography

Basic:


Complementary:


Others resources:

Audiovisual material

http://www.aipo.es/libro/libroe.php

http://www.epsevg.upc.edu/hcd/

http://www.epsevg.upc.edu/eps-idps-projects/

Design of small interfaces