340268 - ENUA-D7P32 - Usability and Accessibility Engineering

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 INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2009). (Teaching unit Optional)
ECTS credits: 6  Teaching languages:  Catalan, Spanish

Teaching staff
Coordinator: MARTA DÍAZ BOLADERAS -
Others: JOSE M. IBAÑEZ GARCÍA

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.
3. 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.
5. 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.
7. 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.
4. 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

Practices

Practices are held in groups of up to five members, to be established at the beginning of the course and will be maintained. Throughout the course there will be three practices where there are problems which will need to apply knowledge which is being acquired. These practices 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>
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<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>
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</table>
## Content

### Module 1 Interacting with objects

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 32h</th>
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<tbody>
<tr>
<td>Pere Ponsa</td>
<td>Theory classes: 8h</td>
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<tr>
<td></td>
<td>Practical classes: 0h</td>
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<tr>
<td></td>
<td>Laboratory classes: 6h</td>
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<tr>
<td></td>
<td>Guided activities: 0h</td>
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<tr>
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<td>Self study: 18h</td>
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#### Related activities:
Examples and study cases where is established a relationship between ergonomics, safety and design. Study case: the use of the Fitts Law in the design and evaluation of input devices

#### Specific objectives:
Understand the role of people in complex systems
Understand basic principles of interaction between humans and objects

### Module 2 Interaction dimensional features

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 39h</th>
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</thead>
<tbody>
<tr>
<td>Judit Casacuberta</td>
<td>Theory classes: 10h</td>
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<tr>
<td></td>
<td>Practical classes: 0h</td>
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<tr>
<td></td>
<td>Laboratory classes: 8h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 0h</td>
</tr>
<tr>
<td></td>
<td>Self study: 21h</td>
</tr>
</tbody>
</table>

#### Related activities:
Re-design of EPI (module 5)

#### Specific objectives:
Establish the links between the industrial ergonomics and the design of products taking into account the inclusion of ergonomic assessment into the design methodology
### Module 3 Interaction psychology and cognitive ergonomics

<table>
<thead>
<tr>
<th>Learning time: 39h</th>
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</thead>
<tbody>
<tr>
<td>Theory classes: 10h</td>
</tr>
<tr>
<td>Practical classes: 0h</td>
</tr>
<tr>
<td>Laboratory classes: 8h</td>
</tr>
<tr>
<td>Guided activities: 0h</td>
</tr>
<tr>
<td>Self study: 21h</td>
</tr>
</tbody>
</table>

#### Description:
Pere Ponsa

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:**
Judit Casacuberta

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

### Learning time:
- Theory classes: 41h 15m
- Practical classes: 0h
- Laboratory classes: 22h 30m
- Guided activities: 0h
- Self study: 16h

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### (ENG) - Mòdul 6 User Experience

**Description:**
4.1 Beyond usability
4.2 Emotional Design
4.3 Interaction with technologies personified
4.4 A special case: the social relationship with robots

**Specific objectives:**
- Enginyeria Kansei
- Diferencial semàntic

### Learning time:
- Theory classes: 1h
(ENG) - Mòdul 7 (IDEO)  

**Description:**
En aquest mòdul es treballarà per tractar de disposar d'una guia pràctica per afrontar diferents situacions de projecte com poden ser, entre d'altres: aportar innovació a productes i serveis destinats a clients, tractar d'entendre millor les necessitats de la gent, introduir solucions de disseny o be adaptar la tecnologia a una nova regió o zona geogràfica, trobar nous mètodes per visualitzar i avaluar el treball a realitzar.

**Module 5 Project**

**Degree competences to which the content contributes:**

**Description:**
Re-design of an indivual safety equipment (EPI)

AL-.116 Interactive Systems Desing Laboratory

Judit Casacuberta

**Related activities:**
Test an EPI
Performance evaluation
Re-design of an EPI
Ergonomic assessment in the re-design

**Specific objectives:**

**Qualification system**

Evaluation is ongoing. In the evaluation of student work submitted will be considered, the project in the group and the acquisition of valued content individual written tests (tests). Memory projects and oral presentation will be assessed. Tests may consist of a part of short ask or multiple choice, and another open questions or development and / or practical exercises, and will focus on any topic of both theoretical and project.

Subject Mark = Mark UX * 0.65 + Mark HCD * 0.35

Mark UX = Project*0.70 + Exam * 0.30
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Bibliography

Basic:


Complementary:


Others resources:

Audiovisual material

Libro-e AIPO
http://www.aipo.es/libro/libroe.php

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

http://www.interaction-design.org/