Design of interactive systems

Academic Year: (2019 / 2020) **Review date: 19/05/2020 11:52:00**

Department assigned to the subject:

Coordinating teacher: MARQUEZ SEGURA, ELENA

Type: Compulsory ECTS Credits : 6.0

Year : 3 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

- Principles of Informatics Engineering
- User Interfaces

OBJECTIVES

1. Theoretical knowledge on the development of interactive systems (PO a) (CECC1, CECC6)
2. Capacity to define usability and utility requirements, designing interactive system for everyone according to a set of specifications (PO a, e) (CECC6)
3. Capacity to design, implement and evaluate interactive systems, applying both usability and accessibility guidelines as well as respecting standards and laws (PO a, c, e) (CECC1, CECC6)
4. Teamwork, taking different roles and proving its leadership (PO d) (CECC6)
5. Capacity to integrate both Information and Communications technologies as well as business processes based on interactive systems in order to satisfy user needs (PO a, e) (CECC1, CECC6)
6. Capacity to communicate knowledge, skills, and capabilities (PO g) (CECC6)

* ABET Program Outcomes
a. An ability to apply knowledge of mathematics, science and engineering.
c. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
d. An ability to function on multidisciplinary teams.
e. An ability to identify, formulate, and solve engineering problems.
g. An ability to communicate effectively.

* ACREDITA+ Competences
CECC1. Ability to acquire knowledge on computational models and principles as well as to apply such knowledge to understand, evaluate, model, and develop new theories, applications and devices related to information systems.
CECC6. Ability to design and evaluate interactive systems and their usage to solve human-computer interaction design problems

DESCRIPTION OF CONTENTS: PROGRAMME

Usability engineering; principles of the design of interactive systems; evaluation of interactive systems; understanding, envisionment and design techniques. Prototyping and evaluation of DUI (Distributed User Interface) applications.

PROGRAMME
1. Introduction to interactive systems
Interactive System (IS) definitions and concepts, user experience (uX) and user centered design approach. Relations between IS and other areas of interest such as HCI, Design Thinking and Software Engineering
Contents:
- User experience design
- Definition of interactive systems

- Design principles
- Design paradigms
- Interactive systems design process

2. Problem understanding

Techniques to frame a problem and understand it from different points of view. Techniques to extract and analyze information

Contents:

- Techniques and artifacts for the analysis
  Observation, elicitation, and specification techniques
- Analysis Products
  Persona, scenario, user story, use case, requirements specification document

3. Solution definition

Techniques to model and define the solution space

Contents:

- Generative techniques
- divergent and convergent design
- Modeling techniques and artifacts

4.Prototyping and evaluation

Techniques and tools to prototype and evaluate a solution. The prototype is based on DUI applications

Contents:

- Prototyping techniques
  Rapid prototyping, evolutionary prototyping
- Artifacts
  Paper prototype, wireframe, mockup, software prototype

- DUI prototyping
  - Basic concepts
  - Guidelines, principles and design patterns
  - context-awareness
  - DUI applications development

- Evaluation
- Interpretative and predictive evaluation
- analytical and experimental evaluation

LEARNING ACTIVITIES AND METHODOLOGY

- Theoretical lectures: 1.5 ECTS (PO a) (CECC1, CECC6)
Lectures in which theoretical concepts will be presented and activities related to the design of interactive systems will be carried out.
- Practical lectures: 1.0 ECTS (PO a, c) (CECC6)
Labs in which technical issues related to the development of interactive systems are exposed.
- Follow-up meetings: 0.5 ECTS (PO a, g) (CECC1, CECC6)
Review of the practical case.
- Individual study: 0,5 ECTS (PO a) (CECC1)
Study of theoretical concepts on the design of interactive systems.
- Project development: 2.5 ECTS (PO a, c, d, e, g) (CECC6)
Project-based learning. Analyzing, designing, and evaluating a practical case within a work group. As a result, student must submit a set of design products.

ASSESSMENT SYSTEM

% end-of-term-examination/test:	40
% of continuous assessment (assigments, laboratory, practicals…):	60

- Theoretical exam: 40% (PO a) (CECC1)
- Labs: 60% (PO a, c, d, e, g) (CECC1, CECC6)

Labs:

% end-of-term-examination/test:	40
% of continuous assessment (assigments, laboratory, practicals…):	60

L1 ideation and design
L2 solution prototyping
L3 prototype evaluation

Final mark of the lab part of the course will be worked out as follows:
L1 (2p) + L2 (3p) + L3 (1p) = 6p
In order to pass the continuous assessment, it is mandatory to obtain a MINIMUM MARK OF 3 over 6 for in the lab activities and 3 over 10 in the exam

BASIC BIBLIOGRAPHY

- Benyon, D. Designing Interactive Systems. A comprehensive guide to HCI and interaction design, Addison Wesley.

- Chris Griffith Mobile App Development with Ionic: No. 2: Cross-Platform Apps with Ionic, Angular, and Cordova, O'Reilly UK Ltd. , 2017

- Cooper, A. Face 3: The Essentials of Interaction Design, Willey.

- Hoc Phan Ionic Framework Cookbook, Packt Publishing, 2015

- James Kalbach Mapping Experiences: A Complete Guide to Creating Value Through Journeys, Blueprints, and Diagrams, O'Reilly Media, Inc.", 10º6

- Lidwell, W Universal Principles of Design, Rockport Publishers.

- Nielsen, J Designing Web Usability, New Riders.

- Preece, J. Interaction Design. Beyond human computer interaction, John Wiley &Sons.

- Tidwell, J Designing Interfaces: Patterns for Effective Interaction Design, O¿Really Media.

- Van Duyne, D.K. The Design of Sites: Patterns for creating Winning Web Sites, Prentice Hall.

- Yvonne Rogers y Helen Sharp Interaction Design: Beyond Human-Computer Interaction, John Wiley & Sons Inc, 2015