User Interfaces

Academic Year: (2020 / 2021) **Review date: 10-07-2020**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: ONORATI , TERESA

Type: Compulsory ECTS Credits : 6.0

Year : 3 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Programming, Principles of Informatics Engineering, Automata and Formal Language Theory

OBJECTIVES

- General competencies
  - Capability to analyze and synthesize (PO b)
  - Capability to organize and plan (PO d)
  - Problem solving (PO c)
  - Teamwork (PO d)
  - Capacity to apply theoretical concepts (PO c)
- Specific competences
  - Cognitive (PO a)
    - Knowledge of user interface elements
    - Knowledge of principles, guidelines and standards for the development of useful and usable user interfaces
    - Techniques for developing web interfaces
    - Knowledge of user-centered design methods
  - Procedural/Instrumental (PO a, c, e, k)
    - Developing an useful and usable user interface
    - Designing an useful and usable web user interface
  - Attitudinal (PO c, d, f)
    - Creativity
    - Quality concerns
    - Achievement motivation
    - Interesting for doing research and figuring out solutions to new problems

DESCRIPTION OF CONTENTS: PROGRAMME

Human-computer interaction; usability: principles, guidelines and standards for the development of user-interfaces; web interfaces.

PROGRAMME:

1. Introduction to Human-Computer Interaction
   a. Definition, utility, relation with User Interface Design
   b. History of HCI
   c. Examples from everyday life
2. User interface design
   a. Definition and utility
   b. User-centered Design
      i. Usability
      ii. Principles, Guidelines, heuristics and Patterns
      iii. Design Methodology
      iv. Prototype
   c. Universal Design
3. Web user Interface Design
   a. Definition, History and Evolution of WWW
   b. Structure and navigation of a web site
   c. Web design principles, heuristics and patterns
4. Interaction design with user interfaces
   a. User eXperience (UX)
   b. Interaction design with website

c. Predictive models
i. Fitt Law
ii. Sterring Law
d. Descriptive models
i. KLM
ii. GOMS
e. Explanatory models
f. Inspection methods
g. Interaction Paradigms
i. Large Scale Computing
ii. Personal Computing
iii. Mobile Computing
iv. Ubiquitous Computing
v. Network Computing
vi. Reality Computing: Augmented Reality and Virtual Reality

Annex. Technologies for developing web user interface
- Web sites (HTML 5 and CSS 3)
- Client-side scripting (JavaScript)
- Design methodology (Prototype and Implementation)

LEARNING ACTIVITIES AND METHODOLOGY

¿ Theoretical lectures: 2 ECTS (PO a)
- Purpose: to achieve the specific cognitive competencies of the course.
- Implementation: lectures in which theoretical concepts on user interfaces are exposed.

¿ Practical lectures: 1.0 ECTS (PO a, c, e, k)
- Purpose: to achieve the specific instrumental competences and develop attitudinal competences.
- Implementation: labs in which technical issues related to the development of user interfaces are exposed.

¿ Practical case: 1.75 ECTS (PO a, c, d, e, k)
- Purpose: to develop both instrumental and attitudinal competencies.
- Implementation: designing and implementing a practical case within a work group.

¿ Programming exercises: 0.75 ECTS (PO a, c, e, k)
- Purpose: to deepen the knowledge of specific topics of the course.
- Implementation: Students resolver programming exercises of web user interfaces.

¿ Final examination: 0.5 ECTS (PO a, c)
- Purpose: to complete the development of specific cognitive and procedural capabilities.

ASSESSMENT SYSTEM

The evaluation system includes the assessment of guided academic activities and practical cases, with the following weights:
Practical case: 40% (PO a, c, d, e, k)
Students must submit two different exercises. The first one about prototyping represents a ten per cent (10%) of the final grade. The second one about implementing and documentation represents a thirty per cent (30%) of the final grade.
Programming exercises: 20% (PO c, f, k)
Students must submit two different exercises, each one of them represents a ten per cent (10%) of the final grade.
Examination: 40% (PO a, c)

Final examination is mandatory and final mark must be higher than 5 of 10.

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

BASIC BIBLIOGRAPHY

- Dix, A., Finlay, J., Abowd, G., Beale, R. Human-Computer Interaction, Prentice Hall, 3rd Edition, 2004.
- Nielsen, J. Designing Web Usability, New Riders, 2000.
- Preece, J. Interaction Design. Beyond human computer interaction., John Wiley &Sons, 2002.
- Shneiderman, B. Designing the User Interface., Addison-Wesley, 1999, 3rd Edition.

ADDITIONAL BIBLIOGRAPHY

- Ballard, B. Designing the mobile user experience., Willey, 2007.

- Basham, B., Sierra, K. & Bates, B. Head First Servlets and JSP: Passing the Sun Certified Web Component Developer Exam., O¿Really Media, 2008.

- Castro, E. HTML, XHTML and CSS., Peachpit Press, 2006.

- Cole, A. Learning Flex 3: Getting up to Speed with Rich Internet Applications., Adobe Dev Library, 2008.

- Cooper, A.m Reinmann, R., Cronid, D. About Face 3: The Essentials of Interaction Design., Wiley, 2007.

- Flanagan, D. JavaScript: The Definitive Guide., O¿Really Media, 2006.

- Gassner, D. Flex 3 Bible., Wiley, 2008.