

Academic Year: ( 2019 / 2020 )

Review date: 05/09/2017 14:53:03

Department assigned to the subject:

Coordinating teacher: BELLUCCI , ANDREA

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

Programming, Principles of Informatics Engineering, User Interfaces

**OBJECTIVES**

- ¿ General competencies
  - o Capability to analyze and synthesize (PO b)
  - o Capability to organize and plan (PO d)
  - o Problem solving (PO c)
  - o Teamwork (PO d)
  - o Capacity to apply theoretical concepts (PO c)
- ¿ Specific competences
  - o Cognitive (PO a)
    - ¿ Knowledge of ubiquitous computing elements
    - ¿ Knowledge of systems, architectures and applications for pervasive computing
    - ¿ The impact of ubiquitous computing on the society
    - ¿ Knowledge of ubiquitous computing design methods
  - o Procedural/Instrumental (PO a, c, e, i, k)
    - ¿ Developing of user interfaces for interactions in an ubiquitous environment
  - o Attitudinal (PO c, d, f)
    - ¿ Creativity
    - ¿ Quality concerns
    - ¿ Achievement motivation
    - ¿ Interesting for doing research and figuring out solutions to new problems
    - ¿ Communication abilities for divulging results to different audiences
- ¿ Specific competences common to computer engineering area
  - o Knowledge and application of characteristics, functionality and structure of distributed systems, computer networks and internet. Design and development of distributed applications (CECRI11)

**DESCRIPTION OF CONTENTS: PROGRAMME**

1. Introduction to Ubiquitous Computing
  - History and Definition
  - Foundations of ubiquitous computing
  - Interaction paradigms for ubiquitous computing
2. Interactions in ubiquitous environments
  - Cross-device interactions
  - Multi-touch interactions
  - Virtual and Augmented Reality
  - Tangible user interfaces
3. Designing ubiquitous interaction
  - Cultural probes and technology probes
  - Rapid prototyping techniques for ubiquitous environments
4. Future Avenues of ubiquitous computing

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## LEARNING ACTIVITIES AND METHODOLOGY

- ¿ Theoretical lectures: 1.5 ECTS (PO a)
  - Purpose: to achieve the specific cognitive competencies of the course.
  - Implementation: lectures in which theoretical concepts on ubiquitous computing 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 ubiquitous computing applications are exposed.
- ¿ Practical case: 2.0 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.
- ¿ Critical analysis of research papers: 1.0 ECTS (e, d, f, g)
  - Purpose: to deepen the knowledge of specific topics of the course.
  - Implementation: Students solve programming exercises of ubiquitous computing applications.
- ¿ Final examination: 0.5 ECTS (PO a, c)
  - Purpose: to complete the development of specific cognitive and procedural capabilities.

## ASSESSMENT SYSTEM

<b>% end-of-term-examination/test:</b>	<b>30</b>
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	<b>70</b>

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)

Critical analysis of research papers: 20% PO (e, d, f, g)

Examination: 40% (PO a, c)

Final examination is mandatory (minimum grade 4/10).

## BASIC BIBLIOGRAPHY

- John Krumm Ubiquitous computing Fundamentals., Chapman & Hall/CRC Press , 2010
- Jonhatan Grudin The Computer Reaches Out: The Historical Continuity of Interface Design, ACM, 1990
- Mark Weiser The Computer of the 21st Century , ACM, 1997
- Mark Weiser, Brown J. S. The Coming of Age of Calm Technology , Copernicus, 1997
- Paul Dourish Where the action is, MIT Press, 2004