340625 - TEIN-R3P01 - Internet Technologies

Coordinating unit:	340 - EPSEVG - Vilanova i la Geltrú School of Engineering
Teaching unit:	701 - AC - Department of Computer Architecture
Academic year:	2017
Degree:	MASTER'S DEGREE IN AUTOMATIC SYSTEMS AND INDUSTRIAL ELECTRONICS (Syllabus 2012). (Teaching unit Optional)
ECTS credits:	5 Teaching languages: Catalan, Spanish, English

Teaching staff

Coordinator:	Xavier Masip Bruin
Others:	Xavier Masip Bruin

Prior skills

Basic knowledge in networking

Requirements

No requisits required

Degree competences to which the subject contributes

Specific:
   4. CB10 - Skills that enable to continue studying in a way that should be self-directed and autonomous

   5. CB6 - Having the knowledge and understanding to provide a basis or opportunity for originality in developing and / or applying ideas, sometimes in a research context
   6. CB7 - Students can apply their knowledge and their ability to solve problems in new or
    unfamiliar contexts within broader (or multidisciplinary) contexts related to their field of study
   7. CB9 - Students can communicate their conclusions, knowledge and rationale underpinning these, to skilled and unskilled public in a clear and unambiguous way
   8. CC01 - Ability to research, design, develop and characterize advanced control systems that enable the dynamic system behave according to the operational performance requirements.
Transversal:
   1. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.
   2. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.

Teaching methodology

Theoretical sessions by the professor as well as interactive team work sessions to discuss the proposed miniprojects
There is no mark to be re-evaluated.

Learning objectives of the subject

Improve knowledge on networking aspects with a clear focus on both, solidifying basic networking concepts and introducing new research trends dealing with current Internet weaknesses. The knowledge introduced in the last theoretical sessions is industrial-oriented, aimed at showing how new technologies may contribute to substantially improve monitoring processes and equipment automatization.

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Study load

Total learning time: 150h			
	Hours large group:	45h	30.00%
	Hours medium group:	0h	0.00%
	Hours small group:	15h	10.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

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Content

1. Internet: Weaknesses and limitations	Learning time: 10h
	Theory classes: 10h

Description:
Clear and deep decription of the current state-of-the-art in Internet, with an strong effort in showing the impact in the industrial sector. First, in this section the student will get in a general view the main set of limitations of internet, emphasizing the main issues and concepts both potentially limiting the scope of Internet, so giving the proper support to the evolution envisioned for the services to be offered to the final user. Second, the student will browse into the specific limitations for smart scenarios, focusing on different sector (city, transportation, industry, health), also showing the way these limitations may hinder the deployment of new services in these domains. Finally, in this section we will propose to categorize the different probles and weaknesses into areas, so making it easy the deployment of advanced solutions

Related activities:
MP1: Turning a real car into a smart car (smart transportation)
MP2:Smart manufacturing (Industry 4.0)

Specific objectives:
Provide knowledge enough about the set of reasons limiting the deployment of new services and apps, so paving the path to find out strategies to overcome the undesirable effects

2. Strategies for distributed smartness	Learning time: 8h
	Theory classes: 8h

Description:
Definition of cloud, fog, and the different systems and devices enabling a suitable and efficient distribution of the overall smartness from the edge device up to the traditional cloud
Resources management
Existing problems and research trends

Related activities:
MP1:Building monitoring system
MP2:Vehicle connectivity platform

Specific objectives:
Introduce the student to distributed systems concepts, particularly into those emphasizing the decoupling of processing tasks at cloud or fog premises. Analyze applicability scenarios oriented to smart scenarios, enabling students to identify main demands to define potential services to be implemented for individual scenarios and being aware of identifying demands coming from both the final client and the current and future technology.

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3. Testing on emulated scenario	Learning time: 15h
	Theory classes: 15h

Description:
Showing the problems and issues identified at lab premises, through a smart city scenario, where students may deploy services in different sectors, also showing technology limitations and enabling the deployment of new solutions through an interactive approach.

Related activities:
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Specific objectives:
Showing issues and limitations of current technology in a close-to-reality scenario, thus enabling the student to interact with the system as well as the to deploy potential solutions.

4. New business models	Learning time: 4h
	Theory classes: 4h

Description:
Introduce the student to the potentially new business models leveraging TIC evolution in smart systems with special attention to the industrial sector, though open to distinct domains. Recognized the fact that flagship ICT technologies in distributed processing along with new computation paradigms and new communication technologies, are all focused on easing the execution of the different jobs and tasks in an smart context, be it purely industrial (industry 4.0) o closer-to-the-user sectors (AR/VR, smart cities, e-health, smart transportation, etc.). Thus, it is mandatory to know how these new models (recently leveraging the "openness" concept) may turn into tuning the current business models and vice-versa.

Related activities:
MP1:Building monitoring system
MP2:Vehicle connectivity platform

Specific objectives:
Getting a good knowledge about the impact technology evolution may have in the pop up of new services and how they may easy the deployment of new models business. Moreover, it is also an objective for this section to getting solid knowledge about market relation-ships in the ICT sector, in order to be perfectly aware about existing limitations that may hinder potential deployments.

Qualification system

Final mark computed as::
FINAL MARK = 0,25 x (Oral presentation) + 0,75 x (MP)

Bibliography