

SUBJECT TEACHING GUIDE

G1470 - Digital Home Infrastructure

Degree in Telecommunication Technologies Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Telecommunication Technologies Engineering			Type and Year	Optional. Year 3
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Optional Subjects				
Course unit title and code	G1470 - Digital Home Infrastructure				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. TECNOLOGIA ELECTRONICA E INGENIERIA DE SISTEMAS Y AUTOMATICA
Name of lecturer	ANTONIO QUINTELA INCERA
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Other lecturers	

3.1 LEARNING OUTCOMES

- Define the automation home concept , and identify needs covered and those planned Services .
- Distinguish and relate Services Control and Communication in the digital home .
- Enter the different services of the digital home control , and the technologies that enable , including sensors , actuators, controllers , communication systems (physical and Protocol Level) , and software configuration and control.
- Choose , deploy and configure gateway between Systems Network Control and Communications Network digital home .
- Meet new application areas of buildings and cities .
- Design, implement and configure a hardware and software level UN system control the digital home, using commercial components .
- Compose Infrastructure Projects Digital Home (IHD) .

4. OBJECTIVES

- To understand the concept of a digital home, identifying the needs it covers and the services it provides.
- To introduce the different services of the digital home and the technologies that enable them , including sensors, actuators, controllers, communication systems (both physical and protocol levels), and configuration and control software.
- To choose, deploy, and configure systems that serve as gateways between the control network and the communication network in the digital home.
- To learn about new applications of the digital home in buildings and cities .
- To design, implement, and configure, at the hardware and software levels, a home automation system based on commercial components.
- To draft projects for Digital Home Infrastructure .

6. SUBJECT PROGRAM

CONTENTS

1	INTRODUCTION TO THE DIGITAL HOME: Required services. Historical analysis, current situation, and future perspectives. The digital home in the new ICT regulation (RD 346/2011).
2	SENSORS AND ACTUATORS: Concept of a sensor. Features of a sensor/transducer. Sensors for home automation: temperature, atmospheric pressure, humidity, wind, luminosity, water and rain, smoke and fires, gases, proximity and movement, sound, glass breakage and opening detectors, biometric and image sensors, electrical energy, and gas and liquid flow. Sensor technologies. Commercial sensors. Actuators for home automation. Acoustic and optical alarms. Electromechanical.
3	INTERCONNECTION SYSTEMS: Definition of interconnection bus. Layer model. Basic concepts about the physical layer: binary flow, encoding, modulation, signals, bandwidth, binary rate... Transmission media. Bus topologies. Examples of buses. Structured cabling. X-10 bus, LonTalk, EIB/KNX, Bluetooth, Zigbee, Ethernet, Wifi, Coronis. Audio/video interconnection.
4	SOFTWARE: Software functions: programming and control. User interfaces and usability.
5	COMMERCIAL SYSTEMS: X-10 System, KNX System, LonWorks System. Design, implementation, and configuration of a system.
6	STANDARDIZATION: What standardization is and its importance. Legal aspects of home automation projects. Historical review and current state of standardization worldwide. Organizations for the development of home automation. EBT regulation and ITC-BT-51 instruction. ICTs. AENOR EA0026:2006 certification of a home automation installation.
7	DIGITAL HOME INFRASTRUCTURE PROJECT: Design of a complete digital home infrastructure project.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Continuous Assessment	Others	No	Yes	40,00
Review Tests	Activity evaluation with Virtual Media	No	Yes	20,00
Lab Practices and Digital Home Infrastructure Project	Laboratory evaluation	No	Yes	40,00
TOTAL				100,00
Observations				
<p>Active learning activities can be carried out in class or outside the classroom, and can be assessed individually or in groups. Each activity will have a maximum score, which will be a percentage of the final grade for the subject. The maximum grade that can be obtained in the subject through continuous assessment (activities 1 to 3) is 10, which is the sum of the maximum grades that can be obtained by completing all proposed activities.</p> <p>To pass the subject, it is necessary to obtain a 5 by calculating the weighted average of the grades from the three evaluation sections and to have more than a 4 in the laboratory practice and final project section.</p> <p>Activities planned for in-class completion will only be assessed for students present in class who submit them at that time. Activities meant to be completed at home can be submitted and assessed by any student who submits them within the established deadline.</p> <p>Remote evaluation of assignments, laboratory practical exercises, and written tests is anticipated in the event of a new health alert due to COVID-19 making it impossible to conduct evaluations in person.</p>				
Observations for part-time students				
he same evaluation criteria will be applied as for the rest of the students.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
<p>La bibliografía básica de la asignatura se basa en libros introductorios al mundo del hogar digital</p> <ul style="list-style-type: none"> - F. J. Falcone Lanás et al., "Instalaciones de telecomunicaciones para edificios", Ed. MARCOMBO, S.A. - C. Romero Morales, "Domótica e Inmótica: viviendas y edificios inteligentes", 2ª edición, Ed. Ra-Ma. - I.R. Matías, C. Fernández-Valdivielso, "Telecomunicaciones en las construcciones", Ed. Universidad Pública de Navarra. - I.R. Matías, C. Fernández-Valdivielso, "El proyecto domótico", Ed. Colegio Oficial de Ingenieros de Telecomunicación. - L. Molina, "Instalaciones automatizadas en viviendas y edificios", McGraw-Hill. - "Guía del usuario del hogar digital". ASIMELEC, 2009. <p>Además, se utilizarán libros más técnicos y específicos, información comercial, manuales de equipos e Internet como fuentes de información.</p>