



Course guide

300309 - SCIOTRA-OT - Smart Cities: Internet of Things and Augmented Reality

Last modified: 02/06/2019

Unit in charge: Castelldefels School of Telecommunications and Aerospace Engineering

Teaching unit: 744 - ENTEL - Department of Network Engineering.

701 - DAC - Department of Computer Architecture.

Degree: BACHELOR'S DEGREE IN NETWORK ENGINEERING (Syllabus 2009). (Optional subject).

BACHELOR'S DEGREE IN TELECOMMUNICATIONS SYSTEMS ENGINEERING (Syllabus 2009). (Optional subject).

Academic year: 2019

ECTS Credits: 6.0

Languages: Catalan, Spanish, English

LECTURER

Coordinating lecturer: Definit a la infoweb de l'assignatura.

Others: Definit a la infoweb de l'assignatura.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. CE 21 TEL. Capacidad para construir, explotar y gestionar las redes, servicios, procesos y aplicaciones de telecomunicaciones, entendidas éstas como sistemas de captación, transporte, representación, procesado, almacenamiento, gestión y presentación de información multimedia, desde el punto de vista de los sistemas telemáticos.(CIN/352/2009, BOE 20.2.2009.)
2. CE 24 TEL. Capacidad de describir, programar, validar y optimizar protocolos e interfaces de comunicación en los diferentes niveles de una arquitectura de redes. (CIN/352/2009, BOE 20.2.2009.)
3. CE 27 TEL. Capacidad de programación de servicios y aplicaciones telemáticas, en red y distribuidas.(CIN/352/2009, BOE 20.2.2009.)

Generalic:

8. EFFICIENT USE OF EQUIPMENT AND INSTRUMENTS - Level 1: Using instruments, equipment and software from the laboratories of general or basic use. Realising experiments and proposed practices and analyzing obtained results.

Transversal:

4. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
5. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
6. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
7. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT



STUDY LOAD

Type	Hours	Percentage
Self study	84,0	56.00
Guided activities	1,0	0.67
Hours large group	39,0	26.00
Hours small group	26,0	17.33

Total learning time: 150 h

CONTENTS

(ENG) INTRODUCCIÓ

Related competencies :

- . CE 21 TEL. Capacidad para construir, explotar y gestionar las redes, servicios, procesos y aplicaciones de telecomunicaciones, entendidas éstas como sistemas de captación, transporte, representación, procesado, almacenamiento, gestión y presentación de información multimedia, desde el punto de vista de los sistemas telemáticos.(CIN/352/2009, BOE 20.2.2009.)
06 URI N1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Full-or-part-time: 9h 05m

Theory classes: 4h

Self study : 5h 05m

(ENG) PROTOCOLS EN XARXES DE SENSORS

Related competencies :

- . CE 21 TEL. Capacidad para construir, explotar y gestionar las redes, servicios, procesos y aplicaciones de telecomunicaciones, entendidas éstas como sistemas de captación, transporte, representación, procesado, almacenamiento, gestión y presentación de información multimedia, desde el punto de vista de los sistemas telemáticos.(CIN/352/2009, BOE 20.2.2009.)
07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
06 URI N1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Full-or-part-time: 28h 24m

Theory classes: 11h 30m

Guided activities: 1h

Self study : 15h 54m



(ENG) XARXES EN SMART HOME/BUILDING

Related competencies :

- . CE 21 TEL. Capacidad para construir, explotar y gestionar las redes, servicios, procesos y aplicaciones de telecomunicaciones, entendidas éstas como sistemas de captación, transporte, representación, procesado, almacenamiento, gestión y presentación de información multimedia, desde el punto de vista de los sistemas telemáticos.(CIN/352/2009, BOE 20.2.2009.)
- 07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
- 04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
- 03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
- 06 URI N1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Full-or-part-time: 12h 30m

Theory classes: 5h 30m

Self study : 7h

(ENG) INTRODUCCIÓ A SMART OBJECTS I INTERNET DE LES COSES

Related competencies :

- 01 UEQ N1. EFFICIENT USE OF EQUIPMENT AND INSTRUMENTS - Level 1: Using instruments, equipment and software from the laboratories of general or basic use. Realising experiments and proposed practices and analyzing obtained results.
- . CE 21 TEL. Capacidad para construir, explotar y gestionar las redes, servicios, procesos y aplicaciones de telecomunicaciones, entendidas éstas como sistemas de captación, transporte, representación, procesado, almacenamiento, gestión y presentación de información multimedia, desde el punto de vista de los sistemas telemáticos.(CIN/352/2009, BOE 20.2.2009.)
- . CE 24 TEL. Capacidad de describir, programar, validar y optimizar protocolos e interfaces de comunicación en los diferentes niveles de una arquitectura de redes. (CIN/352/2009, BOE 20.2.2009.)
- . CE 27 TEL. Capacidad de programación de servicios y aplicaciones telemáticas, en red y distribuidas.(CIN/352/2009, BOE 20.2.2009.)
- 07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
- 04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
- 03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
- 06 URI N1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Full-or-part-time: 12h

Theory classes: 6h

Self study : 6h



(ENG) ARQUITECTURES PER A SMART OBJECTS

Related competencies :

- 01 UEQ N1. EFFICIENT USE OF EQUIPMENT AND INSTRUMENTS - Level 1: Using instruments, equipment and software from the laboratories of general or basic use. Realising experiments and proposed practices and analyzing obtained results.
- . CE 21 TEL. Capacidad para construir, explotar y gestionar las redes, servicios, procesos y aplicaciones de telecomunicaciones, entendidas éstas como sistemas de captación, transporte, representación, procesado, almacenamiento, gestión y presentación de información multimedia, desde el punto de vista de los sistemas telemáticos.(CIN/352/2009, BOE 20.2.2009.)
- . CE 24 TEL. Capacidad de describir, programar, validar y optimizar protocolos e interfaces de comunicación en los diferentes niveles de una arquitectura de redes. (CIN/352/2009, BOE 20.2.2009.)
- . CE 27 TEL. Capacidad de programación de servicios y aplicaciones telemáticas, en red y distribuidas.(CIN/352/2009, BOE 20.2.2009.)
- 07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
- 04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
- 03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
- 06 URI N1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Full-or-part-time: 13h

Laboratory classes: 5h

Self study : 8h

(ENG) SEGURETAT EN XARXES DE SENSORS

Full-or-part-time: 12h 30m

Theory classes: 5h 30m

Self study : 7h

(ENG) GESTIÓ EN XARXES DE SENSORS

Related competencies :

- 01 UEQ N1. EFFICIENT USE OF EQUIPMENT AND INSTRUMENTS - Level 1: Using instruments, equipment and software from the laboratories of general or basic use. Realising experiments and proposed practices and analyzing obtained results.
- . CE 21 TEL. Capacidad para construir, explotar y gestionar las redes, servicios, procesos y aplicaciones de telecomunicaciones, entendidas éstas como sistemas de captación, transporte, representación, procesado, almacenamiento, gestión y presentación de información multimedia, desde el punto de vista de los sistemas telemáticos.(CIN/352/2009, BOE 20.2.2009.)
- 07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
- 04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
- 03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
- 06 URI N1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Full-or-part-time: 12h 30m

Theory classes: 5h 30m

Self study : 7h



(ENG) INTRODUCCIÓ A LA REALITAT AUGMENTADA: QR, PATRONS, GPS

Related competencies :

- 01 UEQ N1. EFFICIENT USE OF EQUIPMENT AND INSTRUMENTS - Level 1: Using instruments, equipment and software from the laboratories of general or basic use. Realising experiments and proposed practices and analyzing obtained results.
- . CE 21 TEL. Capacidad para construir, explotar y gestionar las redes, servicios, procesos y aplicaciones de telecomunicaciones, entendidas éstas como sistemas de captación, transporte, representación, procesado, almacenamiento, gestión y presentación de información multimedia, desde el punto de vista de los sistemas telemáticos.(CIN/352/2009, BOE 20.2.2009.)
- . CE 24 TEL. Capacidad de describir, programar, validar y optimizar protocolos e interfaces de comunicación en los diferentes niveles de una arquitectura de redes. (CIN/352/2009, BOE 20.2.2009.)
- . CE 27 TEL. Capacidad de programación de servicios y aplicaciones telemáticas, en red y distribuidas.(CIN/352/2009, BOE 20.2.2009.)
- 07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
- 04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
- 03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
- 06 URI N1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Full-or-part-time: 9h 05m

Theory classes: 2h

Laboratory classes: 2h

Self study : 5h 05m

(ENG) CAS PRÀCTIC AMB CODIS QR I PATRONS

Related competencies :

- 01 UEQ N1. EFFICIENT USE OF EQUIPMENT AND INSTRUMENTS - Level 1: Using instruments, equipment and software from the laboratories of general or basic use. Realising experiments and proposed practices and analyzing obtained results.
- . CE 21 TEL. Capacidad para construir, explotar y gestionar las redes, servicios, procesos y aplicaciones de telecomunicaciones, entendidas éstas como sistemas de captación, transporte, representación, procesado, almacenamiento, gestión y presentación de información multimedia, desde el punto de vista de los sistemas telemáticos.(CIN/352/2009, BOE 20.2.2009.)
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- . CE 27 TEL. Capacidad de programación de servicios y aplicaciones telemáticas, en red y distribuidas.(CIN/352/2009, BOE 20.2.2009.)
- 07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
- 04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
- 03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
- 06 URI N1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Full-or-part-time: 15h 55m

Laboratory classes: 7h

Self study : 8h 55m



(ENG) CAS PRÀCTIC DE LOCALITZACIÓ PER GPS: LAYAR

Related competencies :

- 01 UEQ N1. EFFICIENT USE OF EQUIPMENT AND INSTRUMENTS - Level 1: Using instruments, equipment and software from the laboratories of general or basic use. Realising experiments and proposed practices and analyzing obtained results.
- . CE 21 TEL. Capacidad para construir, explotar y gestionar las redes, servicios, procesos y aplicaciones de telecomunicaciones, entendidas éstas como sistemas de captación, transporte, representación, procesado, almacenamiento, gestión y presentación de información multimedia, desde el punto de vista de los sistemas telemáticos.(CIN/352/2009, BOE 20.2.2009.)
- . CE 24 TEL. Capacidad de describir, programar, validar y optimizar protocolos e interfaces de comunicación en los diferentes niveles de una arquitectura de redes. (CIN/352/2009, BOE 20.2.2009.)
- . CE 27 TEL. Capacidad de programación de servicios y aplicaciones telemáticas, en red y distribuidas.(CIN/352/2009, BOE 20.2.2009.)
- 07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
- 04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
- 03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
- 06 URI N1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Full-or-part-time: 25h

Laboratory classes: 11h

Self study : 14h

ACTIVITIES

(ENG) CONTROL DELS TEMES 1, 2 I 3

Full-or-part-time: 1h

Theory classes: 1h

(ENG) PROJECTE DE XARXA DE SENSORS PER A SMART CITY

Full-or-part-time: 2h

Theory classes: 2h

(ENG) TREBALL I PRESENTACIÓ D'UN ARQUITECTURA SMART OBJECT

Full-or-part-time: 2h

Theory classes: 2h

(ENG) LABORATORI D'INTRODUCCIÓ ALS SMART OBJECTS

Full-or-part-time: 5h

Laboratory classes: 5h



(ENG) CONTROL DE SEGURETAT EN XARXES DE SENSORS

Full-or-part-time: 1h

Theory classes: 1h

(ENG) TREBALL SOBRE UN FRAMEWORK DE GESTIÓ DE XARXES DE SENSORS

Full-or-part-time: 1h

Theory classes: 1h

(ENG) ENTREGABLE DE LA PRÀCTICA AMB CODIS QR

Full-or-part-time: 7h

Laboratory classes: 7h

(ENG) ENTREGABLE DE LA PRÀCTICA DE REALITAT AUGMENTADA UTILITZANT EL GPS COM A EINA DE LOCALITZACIÓ

Full-or-part-time: 11h

Laboratory classes: 11h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:

- Gómez, C.; Paradells Aspas, Josep; Caballero Herrero, José Eugenio. Sensors everywhere : wireless network technologies and solutions. [S.I.]: Fundación Vodafone España, 2010. ISBN 9788493474058.

RESOURCES

Hyperlink:

- Documents on-line: realitat augmentada
- Documents on-line: LAYAR
- Documents on-line: HITL WASHINGTON
- Documents on-line: TUTORIAL REALITAT AUGMENTADA