Last update: 06-05-2019

230699 - SHORT - Short Range Communications

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering

Teaching unit: 744 - ENTEL - Department of Network Engineering

Academic year: 2019

Degree: MASTER'S DEGREE IN ADVANCED TELECOMMUNICATION TECHNOLOGIES (Syllabus 2019). (Teaching unit Optional)
MASTER'S DEGREE IN TELECOMMUNICATIONS ENGINEERING (Syllabus 2013). (Teaching unit Optional)

ECTS credits: 5 Teaching languages: English

Teaching staff

Coordinator: Paradells Aspas, Josep

Opening hours

Timetable: Wednesday from 15h to 18h
Thursday from 17h to 20h

Prior skills

The course assumes some basics about radio frequency concepts and trasmission techniques such modulation and coding.

Learning objectives of the subject

Introduce students to the short-range communications technologies presenting and justifying its operation

Study load

Total learning time: 125h	Hours large group:	39h	31.20%
	Self study:	86h	68.80%

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Content

Contents and organisation

Learning time: 1h
Theory classes: 1h

Description:
Introduction to the subject, content motivation
Organisation of the subject, contents and evaluation

RFID

Learning time: 6h
Theory classes: 6h

Description:
Basics principles
Applications
Examples of usage: Mifare Ultralight

NFC

Learning time: 3h
Theory classes: 3h

Description:
Physic Layer
Information structure
Example of usage
Home Lab: NFC

Bluetooth

Learning time: 9h
Theory classes: 9h

Description:
Evolution
Protocol architecture (physical layer, link layer, HCI, SDP, profiles,..)
Connection procedures
Bluetooth Low Energy
Home Lab: BLE

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Personal area networks IEEE802.15.4	Learning time: 12h Theory classes: 12h

Description:
Channels and access mechanisms (includes IEEE802.15.4e)
Capacity and power consumption performance
Channel
Procedures
Example of channel Ultra Wide Band (UWB) IEEE802.15.4a
Distance ranging and location
Home Lab: Usage of an UWB system

Wireless Area Networks IEEE802.11	Learning time: 6h Theory classes: 6h

Description:
Architecture and roles
Physical channels: 11, 11b, 11g/a, 11ac, 11ad
Access Mechanisms and performance
Service quality (IEEE802.11e)
Power saving
Security
Mesh networks (IEEE802.11s)
Deployment and optimization
Home Lab: Trace analysis of system IEEE802.11

Testx	Learning time: 2h Theory classes: 2h

Description:
Intermediate tests

Bibliography