



Course guides

230699 - SHORT - Short Range Communications

Last modified: 10/05/2021

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 744 - ENTEL - Department of Network Engineering.

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

Academic year: 2021 **ECTS Credits:** 5.0 **Languages:** English

LECTURER

Coordinating lecturer: Paradells Aspas, Josep

Others:

PRIOR SKILLS

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

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

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

STUDY LOAD

Type	Hours	Percentage
Self study	86,0	68.80
Hours large group	39,0	31.20

Total learning time: 125 h

CONTENTS

Contents and organisation

Description:

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

Full-or-part-time: 1h

Theory classes: 1h



RFID

Description:

Basics principles

Applications

Examples of usage: Mifare Ultralight

Full-or-part-time: 6h

Theory classes: 6h

NFC

Description:

Physic Layer

Information structure

Example of usage

Home Lab: NFC

Full-or-part-time: 3h

Theory classes: 3h

Bluetooth

Description:

Evolution

Protocol architecture (physical layer, link layer, HCI, SDP, profiles,..)

Connection procedures

Bluetooth Low Energy

Home Lab: BLE

Full-or-part-time: 9h

Theory classes: 9h

Personal area networks IEEE802.15.4

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

Full-or-part-time: 12h

Theory classes: 12h



Wireless Area Networks IEEE802.11

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

Full-or-part-time: 6h
Theory classes: 6h

Testx

Description:

Intermediate tests

Full-or-part-time: 2h
Theory classes: 2h

GRADING SYSTEM
