

## Digital transmissions

Number of ECTS credits: 3

Coefficient:

### Description:

Small and medium range wireless and mobile digital transmission technologies. Energy management and routing or "hand-handing" techniques.

### Pedagogical objectives:

Knowledge to be acquired:

- The different wireless transmission technologies with their performance and limitations
- Functional and structural composition required for each of these technologies
- Targets and implementation techniques adapted for each technology ( $\mu$ Controller, Wired logic, Processor core, composite system, ...)
- Encryption techniques used in each case

Skills to be acquired:

- Integrate and program different GSM, ZigBee, WiFi and Bluetooth (LE) devices as an external device of a  $\mu$ Controller or Processor Heart
- Cluster and star transmission with ZigBee modules
- Implementation in the application layer of a cluster routing protocol for Bluetooth modules
- Optimization of energy consumption

### Bibliography:

"Broadband Wireless Access & Local Networks: Mobile Wimax and Wifi", Byeong Gi Lee, Sunghyun Choi  
"GSM Networks: Protocols, Terminology, and Implementation", Gunnar Heine

### Prerequisite:

C programming, digital communication techniques (digital modulation, OFDM, CDMA, MC-CDMA, ...)

Lectures Hours: 8.5

Tutorials Hours: 4

Labs Hours: 16

Knowledge monitoring modalities: 100% continuous assesement

Assesement: Reports of labs, exam

**Leader: Mahmoud ADDOUCHE**

**Participants:**