

## Faculty of Applied Sciences



### ELEC2796 Wireless communications

[30h+30h exercises] 5 credits

This course is taught in the 1st semester

**Teacher(s):** Claude Oestges, Luc Vandendorpe  
**Language:** English  
**Level:** Second cycle

#### Aims

At the end of this lecture, the students will be able to

- simulate a cellular communication system and estimate its performance from these simulations (bit error rate, channel effects, interference effects)
- model terrestrial and earth-sky satellite channels
- design receivers for several types of mobiles systems and evaluate their performance

#### Main themes

Identical to the contents of the course

#### Content and teaching methods

- General description of wireless communication systems
- Multiple acces (FDMA, TDMA, CDMA)
- Channel models for macro-, micro and pico-cellular systems
- Description and performance analysis of GSM
- Channel models for multi-antenna systems
- Description and performance of multi-antenna (MIMO) systems
- CDMA : motivation, codes, rake receiver, multiuser receivers
- Description of the UMTS air interface. Performance of possible receivers. Impact of channel and co-channel interferences
- OFDM systems

#### Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Teaching and learning methods

There will be lectures interleaved with practical training. There is project about the software implementation of a cellular communication system

Prerequisites

ELEC1360 Telecommunications

Assessment

Written examination with exercices, with notes and evaluation of the project

#### Other credits in programs

<b>ELEC22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil électricien	(5 credits)
<b>ELEC23</b>	Troisième année du programme conduisant au grade d'ingénieur civil électricien	(5 credits)
<b>FSA3DS/TL</b>	Diplôme d'études spécialisées en sciences appliquées (télécommunications)	(5 credits)