



Faculté des sciences appliquées

FSA

ELEC2796 **WIRELESS COMMUNICATIONS**

[30h+30h exercices] 5 credits

This course is taught in the 1st semester

Teacher(s): Danielle Janvier, Luc Vandendorpe
Language: english
Level: 2nd cycle course

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

Content and teaching methods

- General description of terrestrial and satellite mobile (cellular communication systems)
- Multiple acces (FDMA, TDMA, CDMA)
- Modelling of the tropospheric channel
- Channel models for macro-, micro and pico-cellular systems
- Description and performance analysis of GSM
- Description of the GPS positionning system
- Description and performance of satellite communication systems
- Link budget for satellite communications
- CDMA : motivation, codes, rake receiver, multiuser receivers
- Description of the UMTS air interface. Performance of possible receivers. Impact of channel and co-channel interferences

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

The complete "Telecommunications" module or equivalent background

Assessment

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

Other credits in programs

ELEC23	Troisième année du programme conduisant au grade d'ingénieur civil électricien	(5 credits)
FSA3DA	Diplôme d'études approfondies en sciences appliquées	(5 credits)