UE Radiofrequency Communication Systems

Niveau d'étude
Bac +5

ECTS
6 crédits

Composante
UFR PhITEM (physique, ingénierie, terre, environnement, mécanique)

Période de l'année
Automne (sept. à dec./janv.)

- **Langue(s) d'enseignement:** Anglais
- **Forme d'enseignement :** Cours magistral
- **Ouvert aux étudiants en échange:** Oui
- **Code d'export Apogée:** PAX9ICAA

Présentation

Description

The goal of this teaching module is to understand the digital modulation techniques used in radio communication systems and high data rate wireline systems, and to learn the design knowledge of analog and mixed integrated functions for signal processing applied to radio communications. Radiocommunication system design will be practically illustrated during labwork sessions.

This teaching module will be divided into 4 parts

- Wireless communications – 18 hours – 2.5 ECTS

Understanding of the modulation techniques for fixed (WiFi, UWB, Zigbee, DVB...) and mobile (2G, 3G, 4G) radio communication systems. Impact of the radio channel on digitally modulated signals is introduced, advanced modulations formats and techniques are described, impact of the different RF front-end components on the digitally modulated waveforms is discussed.

- Analog and Mixed Systems for signal processing – 20 hours – 2.5 ECTS

Design knowledge of analog and mixed integrated functions for signal processing applied to radiocommunications. Optimal filtering in an RF analog receiver chain before conversion. Continuous time analog filter (GmC). Switched capacitor filter. Fully differential integrated Operators (Amplifiers). Oversampling converters Sigma Delta

- ***High data rate wireline systems – 8 hours – 1 ECTS***

Introduction to high data rate wireline communication systems and short range interconnections. Basics on baseband digital modulations. Interconnection systems. Silicon based integrated technologies for interconnections

Heures d'enseignement

CMTD	Cours magistral - Travaux dirigés	28h
UE Radiofrequency Communication Systems - CM	CM	14h
UE Radiofrequency Communication Systems - TD	TD	4h

Période : Semestre 9

Bibliographie

- Techniques de l'ingénieur "Modulations numériques".

- M. Joindot, A. Glavieux "Introduction aux Communications Numériques", éditions Dunod.

- J.C. Bic, D. Duponteil, J.C. Imbeaux, "Eléments de communications numériques", éditions Dunod.

- G.Baudoin et al, "Radiocommunications numériques : Principes, modélisation et simulation", éditions Dunod, 2002.

- D.A. Johns, K . Martin "Analog Integrated Circuits", Willey, 1997.

- R. Design Del Rio, F. Medeiro, B. Perez-Verdu, J.M. De La Rosa, CMOS cascade sigma-delta modulators for sensors & amp, telecom (Hardback, 2006).

- R. Jacob Baker, CMOS Mixed circuit design , Willey, 1997. ISBN 0-471-22754-4

Infos pratiques

Lieu(x) ville

› Grenoble

Campus

› Grenoble - Polygone scientifique