

4.00 credits

30.0 h + 15.0 h

Q2

Teacher(s)	Louveaux Jérôme ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	Basic knowledge in electricity (circuits) and mathematics (Fourier transform).
Main themes	• Signals used in telecommunications • Propagation • Modulations • Telecommunications systems (GSM/3G/4G, Wifi, xDSL) • Error correcting codes • Cryptography
Learning outcomes	At the end of this learning unit, the student is able to : • AA1.1, AA1.3 • AA5.2 At the end of the course, the student will be able to : • describe the various signal formats used in major telecommunications systems; • understand and explain the main characteristics of a communication channel (wired or wireless). • perform a simple link budget; • understand and explain the basic modulation schemes (digital and analog); • understand and explain the basic concepts used in some common communication systems : GSM/3G/4G, Wifi, xDSL; • understand, explain and compute the basics characteristics of error correcting codes; • identify and describe the basic elements of a simple communication scheme.
Evaluation methods	The exam is individual and written. The questions are based on the material taught during the courses and focus on the understanding and ability to explain the various concepts (as opposed to pure memorization). The exam duration is around 2 hours. No document is allowed but a calculator is recommended.
Teaching methods	The course contains • 12 lecture sessions. • 5 exercice sessions.
Content	- Introduction : signals in telecommunications - Basis of line theory ; description of most common cables - Propagation, antennas and link budget - Analog modulations (AM, FM) - Digital modulations - TV and radio systems - Error correcting codes - Data compression - Mobile communications (GSM,3G, LTE, Wi-fi) - xDSL
Inline resources	Moodle web site https://moodleucl.uclouvain.be/course/view.php?id=9427
Bibliography	Transparents disponibles sur Moodle
Faculty or entity in charge	ELEC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Minor in Scientific Culture	MINCULTS	4		
Additional module in computer science	APPSINF	5		
Master [120] in Electro-mechanical Engineering	ELME2M	4		