




5.00 credits

30.0 h + 30.0 h

Q2

Teacher(s)	Vandendorpe Luc ;
Language :	French
Place of the course	Louvain-la-Neuve
Learning outcomes	
Evaluation methods	<p>About the lectures, the students are evaluated individually with respect to the particular objectives stated above. The examination is "closed books".</p> <p>Laboratories are subject to individual evaluation as well oral evaluation by group.</p> <p>The mark for the laboratories evaluation is computed on the basis of marks of an individual evaluation I and of a group evaluation G. If these marks are over 20, the global mark L over 6.66 for the laboratories evaluation is given by</p> $L = a * G/20 + (6.66 - a) * I/20,$ <p>where factor a depends on the individual lab evaluation and is given by</p> <ul style="list-style-type: none"> • If $I \leq 5$: $a = 0$, • If $5 < I \leq 10$: $a = 0.732 * I - 3.66$, • If $I > 10$: $a = 3.66$. <p>To summarize, if the individual evaluation is passed, it contributes for 3/6.66 and the group mark contributes to 3.66/6.66.</p> <p>In case of a second session the marks of the laboratories remain those obtained in the first session and cannot be changed. The laboratory work cannot be redone for the second session.</p>
Teaching methods	<p>The lectures are organized as follows:</p> <p>14 séances de cours</p> <ul style="list-style-type: none"> • 14 lecturing sessions (face to face, remotely, by means of podcasts or combination of these 3 modes, depending on the sanitary situation) • 9 sessions of practical training/monitored exercices (solutions are provided later on on Moodle) • laboratory sessions about AM and FM modulations.
Content	<ul style="list-style-type: none"> • Signals : speech, audio, images, video, data • Signals and systems : analytic signal, complex envelope, random signals, stationnarity, power spectral density • Decibels • Analog modulations : DSB (SC), SSB, VSB, demodulation, noise impact, change of frequency, • Angular modulations : FM (narrow band and wideband), demodulation, effect of noise, capture, threshold effect • Superheterodyne receiver • Baseband transmission : line code, matched filter, correlation, noise effet, Nyquist criterion, Carrierless amplitude/phase modulation • Passband transmission : linear modulations (QAM, PSK), spectral efficiency • Discrete time simulation of a communication link • Time and frequency multiplexing • Error correcting codes: block codes, convolutional codes, hard decoding and soft decoding
Inline resources	https://moodle.uclouvain.be/course/view.php?id=661
Bibliography	<ul style="list-style-type: none"> • Syllabus de cours disponible sur Moodle • Transparents disponibles sur Moodle • Livre de référence disponible à la BST (Communications systems, S. Haykin, Wiley) • Enregistrement des cours disponibles en podcast
Faculty or entity in charge	ELEC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Specialization track in Electricity	FILELEC	5		
Minor in Electricity	LMINOELEC	5		
Master [120] in Mathematical Engineering	MAP2M	5		
Mineure Polytechnique	MINPOLY	5		