

6.0 credits

30.0 h + 45.0 h

2q

Teacher(s) :	Huynen Isabelle ; Janvier Danielle ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	Identical to the contents of the course
Aims :	<p>It is a course giving a general formation about microwave methods, techniques and measurements. The originality of the microwave frequency range is that the wavelength is of the order of magnitude of the size of the devices. This optional course presents the fundamentals of microwave engineering and is proposed as the basic course in this domain for the telecommunication and electronic orientations.</p> <p>After this course the students will be able to :</p> <ul style="list-style-type: none"> <li>- calculate the parameters of various microwave transmission lines</li> <li>- analyse the parameters of various passive circuits</li> <li>- design basic passive devices, in waveguide and planar technology</li> <li>- measure S-parameters of 2-port and 4-port microwave devices, using a scalar network analyser</li> <li>- use adequate active devices in the frequency range of interest</li> <li>- calculate the link budget of an earth-satellite link, taking into account the antenna, spatio-temporal characteristics of the channel and the various noise components</li> </ul> <p><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>
Content :	<p>Contents</p> <ul style="list-style-type: none"> <li>- wave formalism and S-parameters</li> <li>- transmission lines and resonators (planar lines, waveguides)</li> <li>- passive devices (obstacles, junctions, couplers, filters, non-reciprocal circuits)</li> <li>- measurement of circuit parameters : reflection, transmission, power and noise</li> <li>- instrumentation : network analysers, spectrum analyser, calibration methods</li> <li>- sources and active components : vacuum tubes, semiconductors (diodes, transistors)</li> <li>- radiation, transmission and communication systems (link budget)</li> </ul> <p>Teaching methods</p> <p>The course consists of theoretical lessons, practical exercices and a project, using ADS design program of Agilent, where the students design, simulate and measure a passive planar device.</p> <p>Prerequisites</p> <p>Basic knowledge in transmission lines and electronics</p> <p>Assessment</p> <p>Written examination with the book, the project is 25% of the total</p>
Other infos :	<p>Prerequisites :</p> <p>Basic knowledge in transmission lines and electronics</p> <p>Assessment method :</p> <p>Written examination with the book. The project is 25% of the total</p>
Cycle and year of study :	> <a href="#">Master [120] in Electrical Engineering</a>
Faculty or entity in charge:	ELEC