


4 credits

32.5 h + 7.5 h

Q1

Teacher(s)	Contino Francesco ;Macq Benoît ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	<i>The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.</i>
Main themes	The course is divided into 2 parts. The first part consists of an introduction to key concepts of thermodynamics, heat transfer and energy and address the problem of environmental issues. The second part is devoted to the study of electrical, technology, integrated circuits, and discusses the key concepts of electronic analog and digital as well as basic concepts and techniques to understand the telecommunications network architecture.
Aims	<p>1 The course aims to give students the technological base in the fields of energy and environment, electronics and telecommunications, to enable it to understand the specific language of science and collaborate and interact with specialists in these fields. The course also aims to make possible the implementation of a project in control.</p> <p>-----</p> <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>
Evaluation methods	<b>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</b> Written exam with open questions and/or MCQ
Content	Energy and environment - Heat transfer - Fuels and combustion - First law of thermodynamics: U, H, Wm - second principle and entropy diagram (T, S) - Gas ideal thermodynamic transformations - phase change, thermodynamics vapors - Steam Cycles - Cycle Gas and TGV - Context energy renewables - Environmental Issues; phenomenology electronics and telecommunications - Electrical: the concept of current, voltage, energy and power - the main components (R, L, C, source Voltage) - Kirchhoff's laws, Ohm's Law - Calculation of DC and transient - Technology semiconductor principle of the pn junction (diode), operation of MOS transistor, manufacturing technology of an integrated circuit -- Analog electronics: study tours from operational amplifier - Electronic digital combinatorial circuits and sequential circuits - Propagation and modulation signal - Introduction to information theory and coding - Network Architectures - A study of TCP The teaching methods are exposed lectures. Course notes, copies of slides and possibly reading articles will be available to students. Additional references will be given authority by teachers.
Inline resources	see moodle site of the course
Other infos	The score for the course corresponds to the geometrical mean of the two parts (a 0 is replaced by a 2 to avoid absorbing score). In case of failure, the student may ask to keep the score of the part superior or equal to 10.
Faculty or entity in charge	ESPO

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Aims
Bachelor : Business Engineering	<a href="#">INGE1BA</a>	4	<a href="#">LINGE1115</a> AND <a href="#">LINGE1122</a>	
Minor in Scientific Culture	<a href="#">MINCULTS</a>	4		