UCL Université catholique de Louvain

LINGE1317

2015-2016

Research and technological development: energy, electronics and telecommunications

4.0 credits	32.5 h + 7.5 h	1q

Teacher(s) :	Macq Benoît ; Jeanmart Hervé (coordinator) ;
Language :	Français
Place of the course	Louvain-la-Neuve
Prerequisites :	*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.*
Main themes :	The course is divided into 2 parts. T he 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 :	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. *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".*
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.
Other infos :	Written exam
Faculty or entity in charge:	ESPO

Programmes / formations proposant cette unité d'enseignement (UE)

Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Bachelor in Business Engineering	INGE1BA	4	LINGE1213	
Minor in Scientific Culture	LCUSC100I	4	-	