


4.00 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.
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <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>
Evaluation methods	<p>Partie électronique et télécommunications</p> <p>Written examination with open questions and/or MCQs</p> <p>Partie énergie et environnement</p> <p>Students will submit a podcast episode of approximately 15 minutes in length on a topic of their choice related to the topics covered in the podcast episodes they have listened to. The reflective process leading up to the production of this episode will also be assessed. The reflective process leading up to the podcast episode will also be assessed, and should be accompanied by the submission of the podcast in any form (e.g. short written report, audio recording, mind map, ...).</p>
Teaching methods	<p>The energy and environment part consists of two activities. At the beginning of the term, during 4 to 5 sessions, the students choose (by vote) the content of the following presentation. Then, students continue to explore the themes related to the energy transition by listening independently to at least 5 episodes of the Exergie podcast. They will then produce their own podcast episode. To this end, an audience session will provide the basic principles for conducting a podcast. During this phase, there will be a standby session.</p> <p>For the electronics and telecommunications part, lectures are given. Course notes, copies of transparencies and possibly articles for further reading will be made available to the students. Additional references to books will be given by the teachers.</p> <p>In both parts of the course, ethical issues related to the challenges of technological innovations will be addressed. The students are invited to actively address them.</p>
Content	<p>Energy and environment</p> <p>This part addresses the various topics (depending on the current events and on the choices of the students, see "Teaching methods") related to the energy transition and the climate change challenges.</p> <p>Telecom</p> <p>This part addresses the fundamentals of telecommunication networks:</p> <ul style="list-style-type: none"> • Signal modulation and transmission • Introduction to coding • TCP/IP architecture from physical links to applications • Introduction to cryptography and applications (electronic signature, blockchain, ...) • Introduction to artificial intelligence

Inline resources	see moodle site of the course
Bibliography	Des notes de cours, des copies de transparents et éventuellement d'articles pour lectures complémentaires seront mises à la disposition des étudiants. Des références complémentaires d'ouvrage seront données par les enseignants. Les épisodes du podcast Exergie.
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

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Minor in Scientific Culture	MINCULTS	4		
Bachelor : Business Engineering	INGE1BA	4	LINGE1115 AND LINGE1122	