

Teacher(s) :	Labrique Francis ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	<p>Part 1 : Electronics</p> <ul style="list-style-type: none"> - Basic tools for studying electro-technical and electronic devices - Components of semi-conductors used in electronic circuits. Introduction of principle applications (amplification, structuring, processing and transmission of electronic signals). The following applications will be studied : power electronics and their applications, digital electronics (study of a microprocessor), analogue and digital instrumentation <p>Part 2 : Metrology</p> <ul style="list-style-type: none"> - Introduction to measurement error analysis - Definition of measurement properties: sensitivity, resolution, derivative, threshold, hysteresis, extension, reproductivity, stability, precision, signal to noise ratio - Choice and adaptation of measurement instruments in terms of the monitoring objectives - Concept of analogue and digital information - Measurement chain : sensors, interface and storage - Processing of data (relation between numerical value, physical value, linearity, calibrations,) - Tele-measurement - Organisation of data bases. Relation with geographical information systems. Decision support systems. <p>Exercices and laboratory. The exercises and the laboratories envisage to train students in the use of electronic circuits and electronic measurement devices.</p>
Aims :	<p>At the end of the course, the student must be able :</p> <ul style="list-style-type: none"> - to understand the functioning of the basic semi-conducting components and their use in the amplification, structuring, processing and transmission of data ; - to design electronic devices for modifying the stage of an electric engine ; - to understand and use analogue and digital electronic measurement devices ; - to characterize the propagation of errors in a measurement chain ; - to select appropriate measurement devices in terms of the monitoring objective ; - to process information from a measurement chain ; and <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>Lectures deals the fundamental aspects of the course. Exercices and laboratories introduce to applications (use of various types of metrics as digital oscilloscope).</p> <p>Basics of electrical circuits. Analog electronics (amplifiers) Digital electronics (basic circuits, memories, microprocessors) A/D and D/A conversion Main types of sensors Basics of metrology Short introduction to power electronics.</p>
Other infos :	<p>Precursory courses Basic knowledge of electricity</p> <p>Evaluation Return examination</p> <p>Support Slides + reference book (H. Buyse, P. Sente, F. Labrique, "Introduction à l'électronique et ses applications en instrumentation (Ed. Lavoisier))</p>
Cycle and year of study :	<p> > Master [120] in Agricultural Bioengineering > Master [120] in Chemistry and Bio-industries > Master [120] in Environmental Bioengineering </p>
Faculty or entity in charge:	AGRO

