UCLouvain

lphys2103

2026

Analog electronics

5.00 crédits	22.5 h + 22.5 h	Q1

Enseignants	Cortina Gil Eduardo ;
Langue d'enseignement	Anglais > Facilités pour suivre le cours en français
Lieu du cours	Louvain-la-Neuve
Préalables	LPHYS1221 for the students enrolled in the Bachelor in physics who wish to follow this teaching unit within the additional module in physics. Having followed LPHYS1201 is an asset. No prerequisites for students who have obtained a Bachelor's degree in physics and who therefore already have a basic knowledge of : - circuit theory, - the complex algebra and Laplace transform.
Thèmes abordés	This teaching unit is designed to familiarize the student with the basic aspects of analog electronic equipment in modern metrology. It deals with the essential points of linear electronics in semiconductors and small signals, mainly focalized in the study of . Both parts should be followed in parallel and the links between these two parts will be done during practical work and during a personal project.
Acquis d'apprentissage	**A la fin de cette unité d'enseignement, l'étudiant est capable de :** 1. **Contribution of the teaching unit to the learning outcomes of the programme (PHYS2M and PHYS2M1)** AA1: A1.1, A1.5 AA2: A2.5 1. **Specific learning outcomes of the teaching unit** At the end of this teaching unit, the student will be able to : 1. describe the operating mode of the basic electronic, analog components and its limitations ; 2. simulate with LTSPICE software the response of the basic electronic circuits ; 3. analyze and calculate the basic assemblies commonly used in physics in the reading of sensors / detectors ;
Modes d'évaluation des acquis des étudiants	The evaluation is based on : - laboratory reports (25%). Continuous evaluation; - weekly exercices and assignements. Continuous evaluation (25%) - written exam: 6 questions (50%) ; All three parts should be passed with more than 50% each.
Méthodes d'enseignement	Lectures and exercises sessions in auditorium : Directed practical work. Analogue electronics (compulsary) : - experimental study of basic circuits ; - LTSPICE simulation of circuits ; - report after each session.
Contenu	1. Electronic simulation tools LTSpice-IV. 2. Analysis of passive circuits composed of linear and permanent elements. 3. The semiconductor diode. 4. The bipolar transistor. 5. Unipolar transistor or FET with field effect. 6. Differential amplifier. Operational amplifier. 7. Transmission lines. 8. The electronic noise.
Bibliographie	1. Electronic Principles, A. Malvino & D.J. Bates, McGraw Hill (2007). 2. Microelectronic circuits, Sedra & Smith, Oxford University Press (2004).
Faculté ou entité en charge:	PHYS

Programmes / formations proposant cette unité d'enseignement (UE)				
Intitulé du programme	Sigle	Crédits	Prérequis	Acquis d'apprentissage
Approfondissement en sciences physiques	APPHYS	5		🔍
Master [60] en sciences physiques	PHYS2M1	5		🔍
Master [120] en sciences physiques	PHYS2M	5		🔍
Master [120] en enseignement section 4 : physique	PHYS2M4	5		🔍