UCLouvain

lbir1122

2019

In view of the health context linked to the spread of the coronavirus, the methods of organisation and evaluation of the learning units could be adapted in different situations; these possible new methods have been - or will be - communicated by the teachers to the students.

6 credits	30.0 h + 30.0 h	Q2

Teacher(s)	Lambot Sébastien ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	
Aims	*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".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** The exam is only written and covers all the topics of the classes and exercises. The exam is divided into two parts: multiple-choice questions mainly covering theory (10/20) and exercises to solve (10/20).
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** All of the material is exposed in the theoretical courses via slides and notes on the board. The fundamental concepts are illustrated through concrete applications of bioengineering via direct or multimedia illustrations. Exercise sessions play an essential role in understanding the theoretical course and are an apprenticeship in solving concrete contextualized problems in bioengineering. Special attention is given to illustrations and applications with reference to this area (e.g., tractor and agricultural machinery, biophysics, geophysics, etc.). In this respect, the exercises will put into context most of the theoretical concepts based on concrete problems that the bioengineer will face throughout his training and in his professional life. Organization of exercise sessions: Exercise sessions are mandatory and must be prepared in advance by the student (knowledge of the theory). During the sessions, exercises will be presented and the student will have to try to solve them autonomously. Then, the resolution of each exercise will be presented by the assistant, who will also answer to the questions of the students. It is important for the student to do regular self-directed exercises to prepare for the exam.
Content	Thermodynamics: heat and temperature, thermal expansion, law of perfect gases, the first principle of thermodynamics, work in thermodynamics, heat transfer, the second principle of thermodynamics, applications (the greenhouse effect, thermal engines , the refrigerator, the heat pump) Electricity and magnetism: the electric force, the electric field, the Gaussian theorem, the electric potential, capacitors and dielectrics, the electric current, the resistance, the DC circuits, the magnetic field, the electromagnetic induction, the inductance , AC circuits, RLC circuits, applications (electric motor, dielectric sensors, geophysical tools: electrical tomography, electromagnetic induction, ground penetrating radar).
Inline resources	Course slides and other useful information are available on Moodle.
Bibliography	Les ouvrages de base suivis dans le cours sont les livres de Physique de Harris Benson, édition De Boeck (1: Mécanique et 2: Electricité & magnétisme). Ces livres sont également utilisés dans les autres cours de physique du programme d'étude. Les diapositives du cours et notes complémentaires sur certaines parties, ainsi que des exercices et réolutions complémentaires sont mis à la disposition des étudiants via Moodle. L'utilisation d'une calculatrice scientifique est requise pour les séances d'exercices et l'examen.
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Bioengineering	BIR1BA	6		🔍