

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.

3 credits

22.5 h + 22.5 h

Q2

Teacher(s)	Gaigneaux Eric (coordinator) ;Gonze Xavier ;
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>
Aims	<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>
Evaluation methods	<p>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</p> <p>At the written examination, several questions of theory and problems are presented to the students. They demonstrate their knowledge by explaining the corresponding content of the course, and their ability to exploit this knowledge by solving the problems.</p> <p>For the spectroscopy, are more more specifically proposed exercices that require the exploitation of the features of a spectrum in order to infer the characteristics of the sample that has generated it (and vice versa : prediction of a spectrum from the sample characteristics). Recognition of a spectroscopic technique used to generate a given spectrum is also a pillar of the evaluation.</p> <p>Typically the global note is established on a basis of 30 points, coming for 20 of them from the evaluation of the knowledge of the student on the quantum mechanics part, and 10 of them on the spectroscopy part, and then reduced to 20 points.</p>
Teaching methods	<p>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</p> <p>Magistral classes and exercices sessions.</p>
Content	<p>Introduction to quantum mechanics (14,5h + 14,5h): Experimental and theoretical bases. Resolution of Schrödinger equation for simple cases, with one particle (potential well, harmonic oscillator, rigid rotator, hydrogenoid atoms). Approximate treatment: polyelectronic atoms, H₂⁺ molecular ion, diatomic molecules. Molecular dynamics and chemical bonding notions.</p> <p>Basis of spectroscopy (8h + 8h): Distinctions between spectroscopy and spectrometry, spectroscopies of absorption vs emission. Basis of spectroscopies : rotation, vibration, libration, rotational and vibrational Raman, UVVis, XPS, resonance techniques (mostly EPR).</p>
Inline resources	Syllabus are available on the muddle of the course.
Bibliography	<ul style="list-style-type: none"> • Notes de cours (syllabus) disponibles sur le moodle. <p>Le cours ne fait appel à aucun support particulier qui serait payant et jugé obligatoire. Les ouvrages payants qui seraient éventuellement recommandés le sont à titre facultatif.</p>
Other infos	
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Bioengineering	BIR1BA	3	LBIR1211 AND LBIR1221	