UCL Université catholique de Louvain

LBIR1320

2014-2015

Laboratories, seminars and integrated practice of analytical chemistry

7.0 credits	30.0 h + 75.0 h	1q

Teacher(s) :	Garcia Yann ; Dupont Christine (coordinator) ;
Language :	Français
Place of the course	Louvain-la-Neuve
Inline resources:	iCampus
Prerequisites :	Analytical chemistry course (LCHM 1321 or equivalent), followed previously or simultaneously
Main themes :	The activities are declined along three axes, designed to illustrate LCHIM1321 "Analytical chemistry" course: - Part A - Laboratories (guided activities): Practice of standard operations in analytical chemistry: sampling, weighing, volume measurements, standard preparation. Gathering and communicating information: laboratory notebook keeping, treating data and evaluating errors, writing reports (in shortened or extended form). Practice of common methods and approaches typical of solid samples. - Part B - Seminars: Interactive in-depth discussion of concepts taught in course LCHIM1321. Numerical exercises illustrating these concepts. - Part C - Integrated practice (case-studies): Work centred on the analysis of an aqueous medium, related to bioengineering, chosen by each group of students. Practice of common analytical methods, with the emphasis put on the complementary nature of methods, and on the evaluation of results (method, protocol, sampling, operator).
Aims :	At the end of the course, the student will be able to: - Use common analysis methods, whose theoretical basis will have been developed in course LCHM1321; - Perform a professional work in analytical chemistry, through the implementation of a rigorous approach; - Evaluate the analytical performances of the used methods; - Communicate the chosen approach and the obtained results in a rigorous way, in line with the aim of the analysis; - Collaborate with other operators to obtain a coherent set of data, and to collectively discuss these data. More particularly: At the end of part A (Laboratories (guided activities)), the student will be able to plan its work and to perform it in an autonomous way, as well as to criticize the obtained results and to evaluate their consequences. At the end of part B (Seminars), the student will be able to rephrase concepts developed during the lectures of LCHM1321 course, and to debate their origin and applications in analytical chemistry. At the end of part C (Integrated practice (case-studies)), the student will be able to: - Plan and achieve a project in team, and take the required initiatives to make it happen; - Exchange information in an appropriate manner and in due time; - Compare and combine data obtained through different analysis methods. *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 :	Continuous evaluation (laboratory notebook keeping, professional attitude in the laboratory, reports, intermediate tests). Oral examination mainly related to part C (Integrated practice (case-studies)).
Teaching methods :	Resolution of exercises and discussion of concepts in group (part B) Laboratory practice, in team of two (part A) or four (part C) students, and mentoring time to accompany planning of the work (part C).
Content :	Seminars (part B): Overview of analytical chemistry - Physico-chemistry of electrolyte solutions - Redox reactions and analytical applications - Membrane potential and potentiometric analytical methods - Precipitation and equilibria, gravimetric analysis - Acid-base reactions and analytical applications - Volumetry and titrimetry. Laboratory practice (part A and C): Volumetric and gravimetric analysis, direct and indirect potentiometric methods, use of analytical kits. The program is designed in such a way that: - It illustrates the course LCHIM 1321 - It develops the critical mind towards quality of results (based on statistical tools acquired in other courses) - It ensures the progressive acquisition of autonomy in the work: application and discussion of protocols, comparison of different analytical methods, adaptation of protocols. - It allows the treatment of samples of particular interest for future bioengineers (soil samples, bio-industrial products)
Bibliography :	Notes and protocols available to the students. Information shared through iCampus platform. Book: "Fundamentals of Analytical Chemistry" (Skoog et al., 8th Edition, 2004, Thomson)

Other infos :	Part C of the course - Integrated practice (case-studies) - may be chosen alone (3 ECTS) if a sufficient previous practice of common analytical methods can be demonstrated. Le cours fait appel à un support particulier qui est payant et jugé obligatoire, à savoir : Skoog et al (1996). Fundamentals of Analytical Chemistry. 7th edition. Sanders College
Cycle and year of study :	> Bachelor in Bioengineering
Faculty or entity in charge:	AGRO