UCLouvain

wsbim1200

2026

Biomedical instrumental analysis and radiation protection

4.00 credits	30.0 h + 30.0 h	Q1

Teacher(s)	Muccioli Giulio ;
Language :	French > English-friendly
Place of the course	Bruxelles Woluwe
Prerequisites	*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.*
Main themes	Instrumental chemistry (for biomedical students) will go over (i) the main separation techniques and (ii) the techniques allowing the detection and quantification of analytes. Additional techniques (potentiometry, immune-assays, ') will also be discussed.
Learning outcomes	**At the end of this learning unit, the student is able to :** At the end of the course, the student will understand the main instrumental techniques discussed during the activities (classes and practical exercises). More specifically, the student - will be able to explain the physicochemical principles that allow the functioning of a given analytical technique - will be able to explain how the different techniques addressed during the lessons work 1 - will be able to cite and explain the main parameters that can be optimized for a given analytical method - will be able to propose, on a rational basis, the techniques that can answer to an analytical problem in the field of biomedical sciences - will be able to solve analytical chemistry exercises/problems similar to those solved during the seminars/ practical exercises - will have acquired the rigor required for the analytical sciences (as well as for the biomedical sciences), in his answers to the exercises, in his behavior in the lab, in his writing of reports,'
Evaluation methods	Written exam with theory and exercises. For the 1st evaluation (January), 10% of the overall mark corresponds to the practical activities mark (TP).
Content	The lessons give an overview of the main instrumental techniques that could be used in a biomedical setting. These include (but are not limited to) spectroscopic techniques such as UV-Vis absorption, molecular fluorescence and atomic spectroscopy. Mass spectrometry is also discussed. The separation techniques such as liquid and gas chromatography (as well as electrophoresis) are presented. Electrochemical techniques, mainly potentiometry, immuno-assays, and radionuclide-using techniques are also discussed. The seminars allow the students to solve exercises and problems related to instrumental analysis. During these seminars, the notions of pH is revisited (e.g. through the theoretical preparations of buffers), and chromatograms are discussed (determination of resolution, number of theoretical plates,). The practical exercises (labs) allow the students to prepare buffers, and to separate and quantify molecules by liquid chromatography.
Inline resources	An adapted version of the material presented during the lessons is available on the "moodle" platform. The materials for the practical part of the activity is also avaimable on the "moodle" platform.
Faculty or entity in charge	SBIM

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Biomedicine	SBIM2M	4		🔍
Bachelor in Biomedicine	SBIM1BA	4	WSBIM1001 AND WFASB1100 AND WFASB1101	🔍
Master [60] in Biomedicine	SBIM2M1	4		🔍