UCLouvain

lchm1381

2023

Statistics applied to chemistry

4.00 credits	22.5 h + 16.0 h	Q1

Teacher(s)	Uyttendaele Nathan ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	The course must propose the theoretical bases of measure by defining the concepts of samples, population and distribution of measures as well as their main properties. Introduction of hypothesis tests must lead to a critical analysis of data, estimation of errors and to determination of factors affecting measure. The notions of correlation, regression as well as the development of models will be introduced and applied to concrete cases found in current practice in laboratories. Elementary introduction to experimental design will be seen to optimized the experimental processes. Techniques to search for the optimal conditions and localization of extrema will be presented.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 - Bring the chemistry students to treat data linked to experimental data they acquired - Learn to ally the quality of results with economy of acquisition - Conceive and planify experiments - Acquire and treat results of experiments - Interpret results and develop models allowing to predict studied properties
Evaluation methods	- An exam will take place in January. The exam consists of a series of exercises to be solved by hand and on the computer using the reference software used during the course (JAMOVI and R Studio). - A similar exam will be organized for the second session.
Teaching methods	- Lecture by slides (22.5h in Q1). The student may be asked to prepare the course at home based on the slides. The content will then be discussed with the teaching staff to ensure that the content has been understood. - Exercises to be done individually (without supervision) by the student - a discussion on the exercises is possible at each class.
Content	The course gives an introduction to statistical concepts commonly used in science. This course is an introduction and the goal is to give the student the necessary tools to deal with simple cases and to give a sufficient basis to follow more advanced courses. Central to the course are the 'DATA'. The student will learn how to visualize data, characterize data, compare data and perform modelization. There is no basic knowledge required to take this course. The course is given in the first semester in the form of 22.5 hours of lectures. Some exercises will be covered in class and all course material will be available on Moodle.
Inline resources	- Each student must register for the LCHM1381 course on Moodle. Communication between teacher and student will be done through this tool. The slides and other resources will be available on Moodle. - During the first semester, students will be familiarized with the JAMOVI software and R Studio.
Other infos	Course Highlights : 1. Breaking down problems from a statistical perspective and correctly encoding data 2. Basic knowledge of statistics 3. Hypothesis testing 4. Modeling: simple and multiple linear regression, logistic and multinomial regression, Poisson regression
Faculty or entity in charge	SC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Additionnal module in Chemistry	APPCHIM	4		🔍