Universidad Zaragoza

Academic Year/course: 2023/24

30801 - Basics of analytical chemistry

Syllabus Information

Academic year: 2023/24
Subject: 30801 - Basics of analytical chemistry
Faculty / School: 105 - Facultad de Veterinaria
Degree: 568 - Degree in Food Science and Technology
ECTS: 6.0
Year: 1
Semester: First semester
Subject type: Basic Education
Module:

1. General information

Given the introductory nature of this subject for many of the students who will be taking it, the first objective is to explain the nature of the discipline. Students should finish the subject knowing what Analytical Chemistry is , what information it can provide, how it gets that information, how valid it is, and why that information is important in the context of Food Science and Technology.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (https://www.un.org/sustainabledevelopment/es/), so that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement: Goal 3: Health and wellness.

Goal 4: Quality Education.

Goal 5: Gender Equality.

Goal 9: Industry, Innovation and Infrastructure.

2. Learning results

1. Knows how to calculate/evaluate the analytical properties(accuracy, precision, sensitivity, selectivity, detection limit, etc.) of a given method of analysis, compare them with those of other possible methods and choose the most appropriate one in each situation.

2. Knows the different possible stages of an analytical process, knows how to choose which ones are necessary in each situation and knows how to evaluate the influence of each one of them on the final results. In addition, they must be able to perform simple analytical processes in the laboratory.

3. Knows how to perform the calculations leading to the final results (determination of the species of interest) after carrying out an analytical process, including the uncertainty of the results, and is able to make practical decisions based on those results.

4. Knows the main applications of volumetry and gravimetry, knows how to choose the most appropriate type of volumetry in each situation and can perform all the necessary calculations to estimate the concentration of the species of interest after performing volumetry and gravimetry in the laboratory.

5. Knows the advantages and disadvantages of the instrumental techniques of analysis, their fundamentals, the criteria of classification and the most important fields of application.

3. Syllabus

Topic 1. Introduction to Analytical Chemistry. Topic 2. Analytical signal processing. Topic 3. The analytical process. Topic 4.The analytical problem. Topic 5. Evaluation of analytical results. Topic 6. Gravimetric analysis. Topic 7. Volumetric analysis. Topic 8. Volumetric applications.

4. Academic activities

Master classes: 40 hours

Sessions in which the contents of the subject will be explained and problems will be solved

Laboratory practices: 20 hours

Students must perform analytical procedures and complete a report

Questionnaires in Moodle: 13 hours

Problems solved by students on a voluntary, non-face-to-face basis

On-site examination: 2 hours

Personal study. 75 hours

5. Assessment system

The subject will be assessed by the continuous assessment system by means of the following activities:

Laboratory practices (20 % of the grade).

The assessment criteria are: Level of skill acquired in the execution of the experimental work. Accuracy and precision of the results obtained. Calculation of the results and answer to the questions related to the practice performed.

The student who does not pass the practices throughout the term will be entitled to a final exam consisting of a practical in the laboratory.

Final written test (80% of the grade, minimum 4 out of 10 to average with the practices). It will consist of solving problems and theoretical questions. The assessment criteria are: mastery of the contents, problem solving, correct expression of the results (units, significant figures) and justification of arguments.