Universidad Zaragoza

Year : 2020/21

27220 - Laboratory Methods and Quality Control

Syllabus Information

Academic Year: 2020/21
Subject: 27220 - Laboratory Methods and Quality Control
Faculty / School: 100 - Facultad de Ciencias
Degree: 452 - Degree in Chemistry
ECTS: 6.0
Year: 4
Semester: First semester
Subject Type: Compulsory
Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It favors the understanding of the different chemical processes that occur in the environment. A wide range of teaching and learning tasks are implemented, such as lectures, laboratory sessions, assignments tasks, and tutorials.

Students are expected to participate actively in the class throughout the semester.

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials.

Further information regarding the course will be provided on the first day of class.

4.2.Learning tasks

The course includes the following learning tasks:

- **Activity 1:** Quality Control and validation of analytical methods (2 ECTS)
  - Participatory lectures: 20 h, 2 hours per week during the first semester
  - Autonomous work: 25h
  - Examination: 3h
- **Activity 2**: Learn the use of the adequate software and spreadsheets for quality control and validation of analytical methods (1 ECTS)

    - Documentation and problem solving in computer lab sessions: 10h, 5 computer lab sessions of 2h during the first semester
    - Autonomous work: 15h
    - Examination: 2h
- **Activity 3**: Implementation and validation of analytical methods in the laboratory (3.0 ECTS)
    - Laboratory work: 30h, the schedule and the work group will be available for students at the beginning of the course in the Moodle platform.
    - Data treatment and report of the results : 40h of self-assessment work.
    - Presentation and defense of the results: 5h

4.3.Syllabus

The course will address the following topics:

- **Chapter 1: Introduction to the Quality.**
    - i-Quality and Quality Management Systems.
    - ii- Q Components.
    - iii- Historical stages in Quality.
    - iv- Implementation and support of a Q Management System.
- **Chapter 2: Quality in Chemical laboratories.**
    - i- Quality and labs types.
    - ii- Q and analytical properties.
    - iii-Activities in the Analytical laboratory.
    - iv- Examples of Q and not Q.
    - v- Principal elements in Q.
    - vi- Keystones: Q assurance and Q control. Vii-Metrology: primary standard and certified reference materials.
    - viii- Traceability ix- Documentation.
- **Chapter 3- Quality Standards**
    - i-Q structure.
    - ii- Q Management system in the labs: standardization-accreditation-certification.
    - iii- Accreditation: iso 17025: overview.
    - iv- Good laboratory practices-:GLP model.
    - v- QA unity in GLP.
    - vi- Scope in QA programs in GLP.
- **Chapter 4. Statistics tools for Q.**
    - i-Analytical data and results.
    - ii- Analysis of Variance.
    - iii- Uncertainty iv-Control Charts.
- **Chapter 5- Selection and design of the analytical method.**
    - i-Analytical information: data bases.
    - ii-Analytical method selection.
    - iii- Parameters of the analytical methods.
    - iv- Optimization and experimental designs.
- **Chapter 6- Analytical method validation.**
    - i-Q assessment in the analytical lab.
    - ii- Analytical method validation
    - iii- Robustness
    - iv- QC and QA.
    - Iv- Internal and external assessments.
    - V- Interlaboratory tests.

4.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Facultad de Ciencias web (https://ciencias.unizar.es/grado-en-quimica-0).

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=27220&year=2019