

Academic Year/course: 2021/22

## 27220 - Laboratory Methods and Quality Control

### Syllabus Information

**Academic Year:** 2021/22

**Subject:** 27220 - Metodología y control de calidad en el laboratorio

**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

### 2. Learning goals

### 3. Assessment (1st and 2nd call)

### 4. Methodology, learning tasks, syllabus and resources

#### 4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. It favors the understanding of the Technical Quality principles of Analytical Chemical and also the ones which correspond with Quality Management that occur in laboratories with accredited competence. A wide range of teaching and learning tasks are implemented, such as theory sessions, laboratory sessions and different assignments.

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, including a discussion forum.

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

#### 4.2. Learning tasks

This is a 6 ECTS course organized as follows:

- **Lectures** (2 ECTS: 20 hours). Lecture notes and problems will be available for the students at the end of each topic. The students will be assigned unsolved problems which could be re-submitted to the teacher when solved.
- **Laboratory sessions** (3 ECTS: 30 hours). Four-hour sessions a day that take place during, approximately, 3 weeks in laboratory 5 (Building D). Students will be provided in advance with task guidelines for each session.
- **?workshops?** (1.0 ECTS: 10 hours). Five two-hour sessions (1 per week) during 5 weeks in computer classroom. Students will be provided in advance with tasks and guidelines for each session.
- **Seminars and Posters:** Work on lab reports and different assignments during the course, to be done individually or in pairs. A Poster of the experimental works will be presented in a meeting day. Also they will have Seminars with exposition and discussions over themes of interest in Quality & Chemistry, such as DOP or REACH.
- **Autonomous work** (1.5 ECTS: 15 hours).

#### 4.3. Syllabus

**The course will address the following topics:**

### **Section 1. Quality**

Topics: Quality principles and organizational structure. Quality systems and objectives. ODS and quality: a key in the world.

### **Section 2. Quality in Chemical laboratories**

Topics: Quality Elements: Assurance, Control and Assessment. Metrology. Standards and Reference materials. Traceability.

### **Section 3. Standards of Quality**

Topics: Standardization, Certification and Accreditation. Standards: ISO 17025. Technical and management requirements. Good laboratory Practices

### **Section 4. Statistical procedures**

Topics: Results and Analysis of Variance. Uncertainty. Quality Control Diagrams.

### **Section 5. Selection and design of Analytical Methods**

Topics: Selection: Analytical Parameters. Design and optimization procedures.

### **Section 6. Analytical Method Validation**

Topics: Quality assessment of analytical methods. Robustness. Quality assurance and Quality Control. Internal and External Audits. Interlaboratory and Proficiency Tests.

## **Laboratory sessions**

Session 1- Bias and uncertainty in instrumental Equipment?s.

Session 2- Analytical Method Verification and Control of a Trade product.

Session 3 - Variables in a Method: study by factors analysis.

Session 4- Performance characterization: application in a method by flame atomic determination.

Session 5- Validation of a Potentiometric chloride determination in bread.

Session 6- Standard procedure application in trade sweeteners determinations.

### **4.4. Course planning and calendar**

Weeks 1-2: Section 1

Weeks 3-4: Section 2

Week 5: Section 3

Weeks 6-7: Section 4

Weeks 8-9: Section 5

Week 10: Section 6

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=2021](http://biblos.unizar.es/br/br_citas.php?codigo=27220&year=2021)