

## 27220 - Laboratory Methods and Quality Control

### Información del Plan Docente

Academic Year	2017/18
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.Introduction**

#### **1.2.Recommendations to take this course**

#### **1.3.Context and importance of this course in the degree**

#### **1.4.Activities and key dates**

### **2.Learning goals**

#### **2.1.Learning goals**

#### **2.2.Importance of learning goals**

### **3.Aims of the course and competences**

#### **3.1.Aims of the course**

#### **3.2.Competences**

### **4.Assessment (1st and 2nd call)**

#### **4.1.Assessment tasks (description of tasks, marking system and assessment criteria)**

### **5.Methodology, learning tasks, syllabus and resources**

#### **5.1.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 theory sessions, laboratory sessions, assignments, and tutorials.

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

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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.

### 5.2.Learning tasks

**Activity 1:** Quality Control and validation of analytical methods (2 ECTS)

- Participatory lectures: 20 h
- Self-assessment 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.
- Self-assessment work: 15h
- Examination: 2h

**Activity 3 :** Implementation and validation of analytical methods in the laboratory (3.0 ECTS).

- Laboratory work: 30h
- Data treatment and report of the results : 40h of self-assessment work.
- Presentation and defense of the results: 5h

### 5.3.Syllabus

#### Chapter 1: Introduction to the Quality.

i-Quality and Quality Management Systems. li- Q Components. lii- Historical stages in Quality. Iv- Implementation and support of a Q Management System.

#### Chapter 2: Quality in Chemical laboratories.

i- Quality and labs types.li- Q and analytical properties.

lii-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. li- Q Management system in the labs: standardization-accreditation-certification. lii- Accreditation: iso 17025: overview. Iv- Good laboratory practices-:GLP model. V- QA unity in GLP. Vi- Scope in QA programs in GLP.

#### Chapter 4. Statistic tools for Q.

i-Analytical data and results. li- Analysis of Variance. lii- Uncertainty iv-Control Charts.

#### Chapter 5- Selection and design of the analytical method.

i-Analytical information: data bases. ii-Analytical method selection. lii- Parameters of the analytical methods. Iv-

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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.

### 5.4.Course planning and calendar

Lectures: 2h por week during the first semester to complete the total 20h.

Problems: 5 computer lab sessions of 2h during the first semester.

Practical sessions: the schedule and the work group will be available for students at the beginning of the course in the Moodle platform.

### 5.5.Bibliography and recommended resources

**BB** Compañó Beltrán, Ramon. Garantía de la calidad en los laboratorios analíticos / Ramón Compañó Beltrán, Ángel Ríos Castro Madrid : Síntesis, 2002

**BC** Funk, W.; Dammann, V.; Donnevert, G.. Quality Assurance in Analytical Chemistry. Wiley-Blackwell. 2006

**BC** Miller, James N.. Estadística y Quimiometría para química analítica / James N. Miller, Jane C. Miller ; traducción, Carlos Maté Jiménez, Roberto Izquierdo Hornillos . - 1ª ed. en español Madrid : Prentice Hall, 2002

#### Online resources:

AENOR - [<http://www.aenor.es>]

ENAC- [<http://www.enac.es>]

ISO - [<http://www.iso.org>]