

Academic Year/course: 2022/23

27228 - Fast-response Analytical Methods

Syllabus Information

Academic Year: 2022/23

Subject: 27228 - Fast-response Analytical Methods

Faculty / School: 100 - Facultad de Ciencias

Degree: 452 - Degree in Chemistry

ECTS: 5.0

Year: 4

Semester: Second semester

Subject Type: Optional

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. A wide range of teaching and learning tasks are implemented, such as: lectures, practice laboratory sessions, external visit.

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 5 ECTS course organized as follows:

- Lectures and presentation of papers (3,5 ECTS: 35 hours).
- Practice laboratory sessions (1 ECTS:10 horas). Which will include a series of pre-preparation activities for the practice, directed study, virtual practices as well as subsequent activities related to the presentation of results and the preparation of reports
- External visits (0,5 ECTS: 5 horas)

4.3. Syllabus

The course will address the following tasks:

- Topic 1: Introduction. Definitions. Fast-response methods of analysis. Advantages and disadvantages of the Fast-response Analytical Methods (FRAM). Quality of the FRAM. Screening methods: basis, types, analytical possibilities. Curves Roc. LIMS
- Topic 2: Fast-response methods based on spectroscopic, electrical and separation techniques.
- Topic 3: Sensors. Definition and classification. Components of a sensor. Chemical sensors and biosensors.

- Topic 4: Contributions of laser to fast-response analytical methods. Fundamentals of laser. Instrumentation. Analytical methodology. Laser-induced decomposition spectroscopy (LIBS). Applications.
- Topic 5: Other analytical techniques of fast-response. Electron microscopy. X-ray fluorescence. Raman spectroscopy (CARS and SERS). X-ray fluorescence. Infrared thermography. Applications.

Practice sessions.

- In laboratory, related to analytical analyzers, dry chemistry, sensors and remote analysis.
- Outside (visits).

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 Analytical Department, Science website. (<http://ciencias.unizar.es/web/horarios.do>)

The controls will be developed throughout the semester on the dates agreed upon in class and announced in the ADD of the subject and bulletin board of the Department of Analytical Chemistry

The start and date of delivery of the exercises and questions will be announced in the ADD of the subject

The dates and times of the visits will be decided in class and will be announced in the ADD

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=27228>