

Academic Year/course: 2022/23

## 39147 - Spectroscopy

### Syllabus Information

**Academic Year:** 2022/23

**Subject:** 39147 - Spectroscopy

**Faculty / School:** 100 - Facultad de Ciencias

**Degree:** 577 - Joint Program in Physics and Mathematics

**ECTS:** 5.0

**Year:**

**Semester:** Second semester

**Subject Type:** Optional

**Module:**

## 1. General information

### 1.1. Aims of the course

- The aims of the course are aligned with the following Sustainable Development Goals (SDGs):
- Goal 4: Quality Education

## 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 and the acquisition of competencies. It is based on:

- Master lecture sessions, that favor the development/acquisition of reported competencies. (CE1, CE2, CE3, CE4, CE5, CE6, CE10)
- Problem solving sessions, that favor the development/acquisition of competencies, from a practical point of view. (CE1, CE2, CE3, CE5, CE6, CE10)
- Laboratory sessions, that allow the acquisition of technical skills. (CE7, CE8, CE9)
- Examination of the subject: it allows the evaluation of the degree of acquisition of the competencies and the learning results.

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

The learning tasks of this subject are master lecture and problem-solving sessions, the resolution of problems by students (for discussion in class/correction by the teacher), and laboratory sessions and completion of reports.

### 4.3. Syllabus

The course will address the following topics:

Effect of the symmetry on the electronic structure of atoms.

Optical spectroscopy: absorption and emission.

Vibration modes: infrared spectroscopy and Raman spectroscopy.

Magnetic resonance techniques.

Other techniques of resonance and inelastic dispersion.

### 4.4. Course planning and calendar

- The master classes (theory): 35 hours.
- The master classes dedicated to problem solving: 10 hours.
- The laboratory sessions: 5 hours.

The works and reports will be presented before the date of the final exam.

Evaluation sessions: The global evaluation sessions for each term are scheduled by the Faculty of Sciences and published in the website.

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.

### 4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=39147>