Degree competences to which the subject contributes

Specific:
1. Spatial vision capacity and knowledge on graphic representation techniques, both with traditional methods of metrical geometry and descriptive geometry, and by means of computer aided design applications.
2. Capacity to understand and apply basic knowledge principles of general chemistry, organic and inorganic chemistry and their engineering applications.

Transversal:
3. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.

Teaching methodology

The course, with a high experimental content is done through lectures and laboratory sessions and problems.

Learning objectives of the subject

General goal
Familiarize students with the chemical behavior of organic compounds of industrial and environmental interest.

Specific goals
- Understand the classical methods of chemical analysis systems in industrial and environmental interest.
- Know how to interpret the results of the characterization techniques of chemical compounds
### Study load

| **Total learning time:** 75h | Hours large group:       | 0h | 0.00% |
|                            | Hours medium group:      | 30h| 40.00%|
|                            | Hours small group:       | 0h | 0.00% |
|                            | Guided activities:       | 0h | 0.00% |
|                            | Self study:              | 45h| 60.00%|
## Content

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| **2. INFRARED SPECTROSCOPY (IR)**                                       | 7h            | 1h             | 2h                | 4h         |
| Description:                                                           |               |                |                   |            |

| **3. NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY (NMR)**                    | 18h           | 2h             | 5h                | 11h        |
| Description:                                                           |               |                |                   |            |

| **4. ULTRAVIOLET SPECTROSCOPY (UV) AND MASS SPECTROMETRY**              | 8h            | 2h             | 1h                | 5h         |
| Description:                                                           |               |                |                   |            |
### 5. INTRODUCTION TO EXPERIMENTAL METHODS: EXPERIMENTAL SEPARATION OF MIXTURES

**Learning time:** 13h  
Theory classes: 3h  
Practical classes: 2h  
Self study: 8h

**Description:**  

### 6. OBTAINING THE ESSENCE OF CINNAMON

**Learning time:** 7h  
Theory classes: 2h  
Practical classes: 1h  
Self study: 4h

**Description:**  
Separation of an essential oil such as cinemaldehid by drag steam. Liquid-liquid extraction with decanting funnel. Characterization by IR spectroscopy.

### 7. PREPARATION OF THE FOOD ADDITIVE ISOAMYL ACETATE

**Learning time:** 10h  
Theory classes: 2h  
Practical classes: 2h  
Self study: 6h

**Description:**  
Esterification reaction of an alcohol. Isolation by extraction. Structural study by IR spectroscopy.

### 8. EXPERIMENT WITH NATURAL PRODUCTS: VINEGAR AND SUCROSE

**Learning time:** 7h  
Theory classes: 2h  
Practical classes: 1h  
Self study: 4h

**Description:**  
Qualification system

NF = 0,35·NL + 0,15·AL + 0,25 NAC + 0,25 NEF
NF = Final Note
NL = Note lab sessions (laboratory work + practical reports)
AL = Attendance at laboratory sessions
NAC = Note continuous assessment (attendance + delivery exercises)
NEF = Note final exam

Bibliography

Complementary:


Others resources:
- Class notes.