

SUBJECT TEACHING GUIDE

G73 - Chemistry

Double Degree in Physics and Mathematics Degree in Physics

Academic year 2023-2024

| 1. IDENTIFYING DATA | | | | | |
|----------------------------------|---|------------------|--------------------|------------------|--------------------------------------|
| Degree | Double Degree in Physics and Mathematics Degree in Physics | | | Type and Year | Optional. Year 5 Optional. Year 4 |
| Faculty | Faculty of Sciences | | | | |
| Discipline | Subject Area: Chemistry Mention in Applied Physics | | | | |
| Course unit title and code | G73 - Chemistry | | | | |
| Number of ECTS credits allocated | 6 | Term | Semester based (1) | | |
| Web | | | | | |
| Language of instruction | Spanish | English Friendly | Yes | Mode of delivery | Face-to-face |

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|------------------|--|--|--|--|--|
| Department | DPTO. DE QUIMICA E INGENIERIA DE PROCESOS Y RECURSOS. | | | | |
| Name of lecturer | ROSA MARTIN RODRIGUEZ | | | | |
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| Office | E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 3. DESPACHO (S3089) | | | | |
| Other lecturers | MARIA DEL CARMEN PESQUERA GONZALEZ FERNANDO GONZALEZ MARTINEZ MIGUEL GARCIA IGLESIAS | | | | |

3.1 LEARNING OUTCOMES

- To know and connect different Chemistry aspects (electrochemistry, environment and materials) to the matter studied in other disciplines of the Physics Degree.
- To apply Chemistry knowledge (water, atmosphere, green chemistry) to provide solutions to environmental issues of our society (in order to increase quality of life)
- To apply Chemistry knowledge in new materials science research.

4. OBJECTIVES

To understand and connect the Chemical Science with other disciplines of study in the Physics Degree.

To understand and analyze the applications and uses of acid-base and oxidation-reduction chemical reactions and its implication in the society.

To know and understand the main functional groups of organic chemistry, their structure and reactivity.

To know and apply chemistry in Materials Science, particularly nanomaterials and biomaterials.

6. COURSE ORGANIZATION

CONTENTS

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| 1 | Introduction, previous concepts of chemistry. Kinetic balance of the chemical reactions. Acid-base reactions. RESOLUTION OF PROBLEMS/QUESTIONS. LABORATORY EXPERIENCES. |
| 2 | Electrochemistry: Spontaneous and non spontaneous electrochemical processes. Applications as batteries or galvanic cells. Electrolytic cells, applications. RESOLUTION OF PROBLEMS/QUESTIONS. LABORATORY EXPERIENCES. |
| 3 | Organic Chemistry: Main Functional Groups. Structure and reactivity of organic compounds. RESOLUTION OF PROBLEMS/QUESTIONS. LABORATORY EXPERIENCES. |
| 4 | Chemistry of materials: Polymeric materials, nanomaterials and biomaterials. Synthesis methods and characterization techniques. RESOLUTION OF PROBLEMS/QUESTIONS. LABORATORY EXPERIENCES. |

| 7. ASSESSMENT METHODS AND CRITERIA | | | | |
|--|-----------------------|-------------|-----------|--------|
| Description | Type | Final Eval. | Reassessn | % |
| Evaluation method Description: Written exam. Written exam Two written exams will be done. The first one will be realized after the explanation of blocks 1 and 2. The second one will be done after the blocks 3 and 4. | Written exam | No | Yes | 55,00 |
| Evaluation method Description: Working individually or in group. Development and exposition of a bibliographic work relation with the subject contents. | Work | No | No | 10,00 |
| LABORATORY PRACTICES | Laboratory evaluation | No | No | 35,00 |
| TOTAL | | | | 100,00 |
| Observations | | | | |
| <p>Both attendance at practices and submitting the report of the same is mandatory.</p> <p>In the laboratory, the use of gown and safety glasses that students must acquire will be compulsory. Without this material, entry to the laboratory will not be allowed (UC laboratory work regulations).</p> <p>The recovery will be a written exam and will be done on the date assigned by the centre at the end of the semester.</p> <p>In the extraordinary Assessment, the qualification of the individual or group work will be maintained (10%), and of the laboratory practices (35%) and a Written Exam (55%) will be carried out.</p> <p>In case of contingency, the entire development of the practices will be explained in videos made in the laboratory by the teacher who will be uploaded to the Moodle Platform and the students will submit questions related to the practices viewed.</p> | | | | |
| Observations for part-time students | | | | |
| <p>Part-time students must do the work (10%) and, in the written examination, they must answer questions related to laboratory practices (90%). The extraordinary call will maintain the qualification of the Work (10%) and a written examination (90%).</p> | | | | |

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

R. Chang, "Química". Ed. Mc Graw Hill. 2013 (11ª Ed.).

L. Mangonon, "Ciencia de materiales". Prentice Hall. 2002.