

Course guide

340714 - QUIM-F1 - Chemistry

Last modified: 07/03/2025

Unit in charge: Vilanova i la Geltrú School of Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.

Degree: BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING AND RAILWAY SYSTEMS (Syllabus 2024).
(Compulsory subject).

Academic year: 2024 **ECTS Credits:** 6.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: NATIVITAT SALVADÓ CABRÉ

Others: NÚRIA JIMÉNEZ GARCÍA
JOAQUIM OLIVÉ DURAN
MONTSERRAT RUIZ PLANAS
NATIVITAT SALVADÓ CABRÉ
ESTHER ESCRIBANO ARANDA

PRIOR SKILLS

Students who have not done Chemistry subjects in the higher school or in the higher degree modules, a detailed reading of some chemistry text for the higher school is recommended, also a reading of the pages, F1 to F104, of "FUNDAMENTOS" that you will find in the book Principles of Chemistry. This book is recommended in the bibliography and can be found in the EPSEVG library:

Authors: Peter Atkins / Loretta Jones
Principios de Química. Los caminos del descubrimiento
5a Edición. Editorial Médica Panamericana

These pages contain an introduction to the chemical language, the most basic concepts, some examples and exercises.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

5. CE4. Ability to understand and apply principles of basic knowledge of general chemistry, organic and inorganic chemistry and its applications in engineering.

Transversal:

1. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
2. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.
3. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
4. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 1. Analyzing the world's situation critically and systemically, while taking an interdisciplinary approach to sustainability and adhering to the principles of sustainable human development. Recognizing the social and environmental implications of a particular professional activity.

TEACHING METHODOLOGY

- 1 Teaching in the classroom
2. Use of teaching material: visualizations, animations and videos
3. Solving exercises and problems, applications of chemistry to the everyday world.
4. Experimental chemistry in the laboratory
5. Student-teacher interaction based on exercises and questions proposed in classroom
- 6 Teacher-student interaction during time scheduled

LEARNING OBJECTIVES OF THE SUBJECT

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STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours small group	30,0	20.00
Hours large group	30,0	20.00

Total learning time: 150 h

CONTENTS

Structure of matter

Description:

- Introduction to chemistry
- Electronic structure
- Periodic Table and Periodic Properties
- Chemical bonds
- Molecular structure
- States of matter: gas, solid and liquid
- Solutions

Related activities:

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Full-or-part-time: 60h

Theory classes: 12h

Practical classes: 6h

Laboratory classes: 6h

Self study : 36h



Chemical Transformations

Description:

- Chemical reactions
- Thermochemistry
- Chemical Kinetics
- Chemical equilibrium
- Acid and based
- Reduction-oxidation reactions, electrochemistry

Full-or-part-time: 90h

Theory classes: 18h

Practical classes: 9h

Laboratory classes: 9h

Self study : 54h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:

- Atkins, P. W. Principios de química: los caminos del descubrimiento. 5a ed. Buenos Aires [etc.]: Médica Panamericana, 2012. ISBN 9789500602822.
- Chang, Raymond; Overby, Jason. Química [on line]. 13a ed. México: McGraw-Hill, 2020 [Consultation: 15/02/2024]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=10619. ISBN 9781456277161.
- Petrucci, Ralph H; Pando García-Pumarino, Concepción; Rodríguez Renuncio, Juan A; Iza Cabo, Nerea; Bissonnette, Carey; Madura, Jeffery D; Herring, F. Geoffrey. Química general : principios y aplicaciones modernas [on line]. 11a ed. Madrid: Pearson Prentice Hall, 2017 Available on: https://www.ingebook.com/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=6751. ISBN 9788490355336.

Complementary:

- Chang, Raymond. Fundamentos de Química [on line]. Madrid: McGraw-Hill, 2011 [Consultation: 07/03/2024]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=5646. ISBN 9786071505415.
- Gray, Theodore W. The Elements : a visual exploration of every known atom in the universe. New York: Black Dog & Leventhal, 2009. ISBN 9781579128142.

RESOURCES

Audiovisual material:

- Nom recurs. Resource

Other resources:

<https://www.rsc.org/periodic-table>
> <https://www.euchems.eu/wp-content/uploads/2018/10/CATALAN-Periodic-Table-Element-Scarcity.pdf>
> https://arxiu.termcat.cat/diccionarisenlinia/docs/Quimica_AnnexNomenclaturaFormulacioQI.pdf
> https://arxiu.termcat.cat/diccionarisenlinia/docs/Quimica_AnnexNomenclaturaQO.pdf />