

Course guide

330155 - EPP - Process and Product Engineering

Last modified: 28/04/2025

Unit in charge: Manresa School of Engineering
Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering.

Degree: BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2016). (Compulsory subject).

Academic year: 2025 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: LÍDIA GARCIA SAEZ

Others: MARIA DOLORS GRAU VILALTA - FRANCESC XAVIER DE LAS HERAS CISA

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. Interpret the flow chart of any chemical-industrial process.
2. Analyze and distinguish the operation of thermal, catalytic, high pressure and electrolytic processes, and their environmental problems.

Transversal:

3. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
4. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
5. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
6. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.
7. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

Type	Hours	Percentage
Hours small group	15,0	10.00
Self study	90,0	60.00
Hours large group	45,0	30.00

Total learning time: 150 h



CONTENTS

title english

Description:

Abbreviated equipment diagrams
Unit Operations
Unitary Processes
Flowcharts

Specific objectives:

Learn the purpose of the different unit operations and unit processes most used in Chemical Plants.
Interpretation and elaboration of flow diagrams

Full-or-part-time: 30h

Theory classes: 16h

Self study : 14h

(ENG) Contingut 1. Processos de Reacció Tèrmics

Description:

Pyrite roasting. 6 H
Natural gas refurbishment. 4 H
Coal combustion: classic and in a fluidized bed. Environmental problems. 6 H
Coal gasification: obtaining clean energy. 2 H

Full-or-part-time: 30h

Theory classes: 8h

Self study : 22h

(ENG) Contingut 2: Processos de Reacció Catalítics

Description:

Heterogeneous catalysis: Obtaining sulfuric acid. 6 H
Homogeneous catalysis. OXO process. 2 H

Full-or-part-time: 28h

Theory classes: 10h

Self study : 18h

(ENG) Contingut 3: Processos de Reacció a Elevada Pressió

Description:

Ammonia synthesis. 6 H
Methanol synthesis. 2 H

Full-or-part-time: 23h

Theory classes: 8h

Self study : 15h

(ENG) Contingut 4: Processos de Reacció Electrolítics

Description:

Electrolysis of sodium chloride in aqueous solution 6 H, and in molten phase 2 H

Full-or-part-time: 20h

Theory classes: 8h

Self study : 12h

(ENG) Contingut 5: Obtenció de Productes Finals

Full-or-part-time: 19h

Theory classes: 7h 30m

Laboratory classes: 2h 30m

Self study : 9h

ACTIVITIES

(ENG) TÍTOL DE L'ACTIVITAT 1. - POWERPOINT INTERACTIU "LA PLANTA QUÍMICA EN IMATGES"

Full-or-part-time: 8h

Self study: 8h

(ENG) TÍTOL DE L'ACTIVITAT 2.-VISITA A UNA INDÚSTRIA

Full-or-part-time: 5h

Self study: 3h

Theory classes: 2h

(ENG) TÍTOL DE L'ACTIVITAT 2.1.- TREBALL VISITA INDÚSTRIA

Full-or-part-time: 10h

Self study: 10h

(ENG) TÍTOL DE L'ACTIVITAT 3.- INTERPRETACIÓ, ELABORACIÓ I ENTREGA DELS "DIAGRAMES DE FLUX" DE CADASCUNS DELS PROCESSOS QUÍMICS ESTUDIATS

Full-or-part-time: 15h

Self study: 15h

(ENG) TÍTOL DE L'ACTIVITAT 4. QÜESTIONARIS ATENEA

Full-or-part-time: 12h

Self study: 12h

(ENG) TÍTOL DE L'ACTIVITAT 5. TREBALL GLOBAL: EXPOSICIÓ D'UN TREBALL EN GRUP AMB TORN DE PREGUNTES

Full-or-part-time: 14h

Self study: 10h

Theory classes: 4h

(ENG) TÍTOL DE L'ACTIVITAT 6. PROVA INDIVIDUAL D'AVALUACIÓ ESCRITA.

Full-or-part-time: 14h

Self study: 10h

Theory classes: 4h

(ENG) TÍTOL DE L'ACTIVITAT 7. PROVA INDIVIDUAL D'AVALUACIÓ ESCRITA DIAGRAMA DE FLUX.

Full-or-part-time: 12h

Self study: 10h

Theory classes: 2h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:

- Kural, O., ed. Coal: resources, properties, utilization, pollution. Istanbul: Orhan Kural, 1994. ISBN 9759570114.
- Metcalf & Eddy. Wastewater engineering: treatment, disposal and reuse [on line]. 3rd ed. revised. New York: McGraw-Hill, 1991 [Consultation: 18/01/2023]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pg-origsite=primo&docID=5662641>. ISBN 0070416907.
- Vian Ortuño, A. Introducción a la química industrial [on line]. 2ª ed. Barcelona: Reverté, 1994 [Consultation: 27/05/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=3214793>. ISBN 842917933X.
- Büchner, W., i altres. Industrial inorganic chemistry [on line]. New York: VCH, 1989 [Consultation: 10/06/2022]. Available on: <https://onlinelibrary-wiley-com.recursos.biblioteca.upc.edu/doi/book/10.1002/9783527613328>. ISBN 3527266291.
- Chenier, P. J. Survey of industrial chemistry. 2nd ed. New York: VCH Publishers, 1992. ISBN 1560810823.
- Stocchi, E. Industrial chemistry. Chichester: Ellis Horwood, 1990. ISBN 0134573188.

Complementary:

- Meyers, R. A. Handbook of chemicals production processes. New York: McGraw-Hill, 1986. ISBN 0070417652.
- Shreve, R. N. Shreve's chemical process industries. 5th ed. New York: McGraw-Hill, 1984. ISBN 0070571473.
- Kirk, R. E.; Othmer, D. F. Enciclopedia de tecnología química [on line]. México: Limusa, 1998 [Consultation: 29/07/2022]. Available on: https://search-ebshost-com.recursos.biblioteca.upc.edu/login.aspx?direct=true&AuthType=ip,uid&db=nlebk&AN=865729&site=ehost-live&ebv=EB&ppid=pp_Cover. ISBN 9681855760.
- Riegel, E. R. Riegel's handbook of industrial chemistry [on line]. 10th ed. New York: Kluwer Academic. Plenum, 2003 [Consultation: 10/06/2022]. Available on: <https://link-springer-com.recursos.biblioteca.upc.edu/referencework/10.1007%2F0-387-23816-6>. ISBN 0306474115.

RESOURCES

Other resources:

- Grau i Vilalta, M. Dolors. Química Industrial II: taules, gràfiques i esquemes. Manresa: EPSEM, 1997.
- Grau Vilalta, M. Dolors. Esquemes d'equips abreujats. [Manresa]: EPSEM. Departament d'Enginyeria Minera i Recursos Naturals, 2002.
- Grau i Vilalta, M. Dolors. La planta química en imatges (publicació digital). 2001.