



Universitat de Lleida

DEGREE CURRICULUM
**INDUSTRIAL CHEMISTRY
PROCESSES**

Coordination: BARTOLI SOLER, ESTHER

Academic year 2023-24

Subject's general information

Subject name	INDUSTRIAL CHEMISTRY PROCESSES			
Code	102348			
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Master's Degree in Leather Engineering	1	COMPLEMENTARY TRAINING	Blended learning
	Master's Degree in Leather Engineering		COMPLEMENTARY TRAINING	Attendance-based
	Not informed	3	COMPULSORY	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRALAB	PRAULA	TEORIA
	Number of credits	0.4	2.6	3
	Number of groups	1	1	1
Coordination	BARTOLI SOLER, ESTHER			
Department	INDUSTRIAL AND BUILDING ENGINEERING			
Teaching load distribution between lectures and independent student work	60 hours classroom lessons Self study 90 hours			
Important information on data processing	Consult this link for more information.			
Distribution of credits	3 Teoria, 2,6 praula, 0,4 pralab			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
BARTOLI SOLER, ESTHER	esther.bartoli@udl.cat	6	

Learning objectives

At the end of the course the student must be able to:

- Interpret the different processes in industrial chemistry.
- Explain the differences between small and large scale processes (type of reagents, temperature control, ..).
- Analyze the different methods of catalysis at the industrial level.
- Make a critical study of an industrial process.
- Obtain a global vision of the problems of the chemical industry, the available resources and the replacement routes in case of exhaustion.
- Compare the different raw materials, analyze the methods of obtaining products from these.
- Formulate the diagram and balance (raw materials, energy, water and waste) of any process.
- Delve deeper into powerful products such as polymers.
- Recognize and evaluate the impact of these industries and their products on the environment

Competences

Basics

B03 That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical issues.

B04 That students can transmit information, ideas, problems and solutions to a specialized and non-specialized public.

B05 That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

Generals

CG3. To synthesize basic and technological subjects, which enable them to learn new methods and theories, and provide them with versatility to adapt to new situations.

CG4. To solve problems with initiative, make decisions, creativity, critical reasoning and to communicate and transmit knowledge, skills and abilities in the field of Industrial Chemical Engineering.

CG7. To analyze and assess the social and environmental impact of technical solutions.

CG10. To work in a multilingual and multidisciplinary environment.

Specific

CE20. To analyze, design, simulate and optimize processes and products.

CE22. To design, manage and operate simulation, control and instrumentation procedures of chemical processes.

Transversal

CT1. To develop a proper understanding and oral and written expression of Catalan and Spanish.

CT3. To implement new technologies and technologies of information and communication.

CT5. To apply essential notions of scientific thinking.

Subject contents

General Contents

T.1 Introduction to Industrial Chemistry

- Chemical Industry
- Classifying
- Raw materials
- Energy
- Waste
- Environmental

T2 Sulphuric Acid and S

- Raw materials
- Location, extraction and main producers
- Industrial Process
- Health and process security
- REACH

T3 Formic acid

- Raw materials
- Location, extraction and main producers
- Industrial Process
- Health and process security
- REACH

T.4 Sodium Carbonate

- Raw materials
- Location, extraction and main producers
- Industrial Process
- Health and process security

- REACH

T.5 Soda ash and chlorine

- Raw materials
- Location, extraction and main producers
- Industrial Process
- Health and process security
- REACH

T.6 Hydrogen

- Raw materials
- Location, extraction and main producers
- Industrial Process
- Health and process security
- REACH

T.7 Ammonia

- Raw materials
- Location, extraction and main producers
- Industrial Process
- Health and process security
- REACH

T.8 Acetylene

- Raw materials
- Location, extraction and main producers
- Industrial Process
- Health and process security
- REACH

T.9 Ethylene Oxide

- Raw materials
- Location, extraction and main producers
- Industrial Process
- Health and process security
- REACH

T.10 Lubricants

- Raw materials

- Location, extraction and main producers
- Industrial Process
- Health and process security
- REACH

T.11 Polimers

Raw materials

- Location, extraction and main producers
- Industrial Process
- Health and process security
- REACH

T.12 Litium and bateries

Raw materials

- Location, extraction and main producers
- Industrial Process
- Health and process security
- REACH

T.13 Nuclear Energy.

Raw materials

- Location, extraction and main producers
- Industrial Process
- Health and process security
- REACH

Methodology

Methodology

- Theory in classes of large groups: Expositive classes by the teacher, with the explanation of concepts, materials and the work plan.
- For each module, exercises will be proposed individually and autonomously, which will be evaluated by the teacher.
- Preparation of a topic, with presentation and oral and written communication.

Students also have the responsibility to reinforce their knowledge independently, based on the didactic material facilitated and / or recommended by the teacher.

Development plan

Week	Methodology	Classroom/Virtual hours	Hours of autonomous work
1-8	Preparation Topics and presentation Visit and presentation project	30	50
9	Exam 1 (E1))	2	
10-15	Preparation Topics and presentation Visit and presentation project	26	40
16	Exam 2 (E2)	2	

Evaluation

In the middle of the semester there will be a written test (E1) that corresponds to the subject taught during this first part and that represents 20% of the overall mark. At the end of the semester there will be another written test (E2) that corresponds to the subject taught during this second part which represents 20% of the overall grade. There will also be a grade of: In addition there will be a note of: Block I, which includes the preparation and presentation of the topics of the subject (BI) that represents 35% of the overall grade and a note of: Block II, which includes the preparation and exhibition of the scheduled visits (BII) which represents 25% of the global note.

The final grade of the course will be determined by:

$$NO1 = BI * 0.35 + BII * 0.25 + E1 * 0.200 + E2 * 0.20$$

Those who have not passed the subject at the first opportunity will be able to take a final recovery exam (ER) that will include all the material taught during the course.

The final grade of the course will be:

$$NO2 = 0.40 ER + 0.35BI + 0.25 BII$$

Tests E1, E2, and ER will be held on the dates set by the Directorate of Studies.

NOTE: The student who has the go-ahead to be evaluated by alternative evaluation (see requirements and procedure in the evaluation regulations) must take the presentations of Block I and II in person/videoconference, and the end-of-course exam that will have a 40% weight as well as recovery.

Bibliography

- Subject notes
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- Perrin, R; Scharff, J.P. *Chimie industrielle*. 2e éd. Paris: Masson, 2002. ISBN 2-10-006747-8
- Mujlionov, I.P. et al; *Tecnología Química Industrial vol 2*, Moscu ed.Mir, 1979
- Austin, G.T. *Manual de procesos químicos en la industria*. México D.F.: McGraw-Hill, 1992. ISBN 970-10-0388-8
- Gary, J.H.; Handwerk, G.E. (1980). *Refino de petróleo : tecnología y economía*. Barcelona: Reverté. ISBN
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- Wittcoff, H.A.; Reuben, B.G. *Productos químicos orgánicos industriales*. Mexico: Limusa, 1987. ISBN 968-18-1882-2. 2 vols.
- Weissermel, K.; Arpe, H-J. *Química orgánica industrial : productos de partida e intermedios más importantes*. 2ªed. Barcelona: Reverté, 1981. ISBN 84-291-7989-5
- Revistes varies de Química Industrial i d'Enginyeria Química