

Course Unit	Chemical Engineering Process Laboratory	Field of study	Chemical Engineering Processes
Master in	Chemical Engineering	School	School of Technology and Management
Academic Year	2023/2024	Year of study	1
Type	Semestral	Semester	2
Level	2-1	ECTS credits	6.0
Code	6362-756-1203-00-23		
Workload (hours)	162	Contact hours	T - TP - PL 60 TC - S - E - OT - O -

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) José António Correia Silva

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Apply the conservation principles of mass and energy and the concept of modelling in the analysis of experiments
2. Develop experimental work to analyze separation processes
3. Understand through experimentation process dynamics and control
4. Develop experimental work to analyze chemical reactors
5. Develop proficient oral presentation skills through group project presentations

Prerequisites

Before the course unit the learner is expected to be able to:

Dominate basic concepts about chemical reactors, separation processes and system dynamics

Course contents

Process control and dynamics. Chemical reaction engineering. Advanced separation processes: membranes and adsorption

Course contents (extended version)

1. Process dynamics and control: ON-OFF control; feedback control. Transient behavior of a surge tank
2. Chemical reaction engineering. Tubular reactor. Stirred tanks in series
3. Advanced separation processes: reverse osmosis in membranes; fixed bed adsorption

Recommended reading

1. Octave Levenspiel, Chemical Reaction Engineering, 3rd Edition, John Wiley & Sons, 1998.
2. D. M. Ruthven, Principles of adsorption and adsorption processes, John Wiley & Sons, 1984.
3. D. E. Seborg, T. F. Edgar e D. A. Mellichamp, Process Dynamics and Control, John Wiley & Sons, 1989.

Teaching and learning methods

Laboratory classes (60 hours): Execution of experimental work Homework (92 hours): Plan of experimental activity, technical reports and oral presentations

Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
 - Laboratory Work - 40%
 - Reports and Guides - 20%
 - Presentations - 40%
2. Alternative 2 - (Regular, Student Worker) (Final, Supplementary, Special)
 - Laboratory Work - 40%
 - Reports and Guides - 20%
 - Final Written Exam - 40%

Language of instruction

English

Electronic validation

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12-02-2024	13-03-2024	13-03-2024	16-03-2024