



PERSONA CIENCIA EMPRESA
UNIVERSITAT RAMON LLULL

COURSE: ENGINEERING LABORATORY

SUBJECT MATTER: Chemical Transformations
Engineering

MODULE: Specific Technology

PROGRAM: Degree in Chemical Engineering

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GENERAL CHARACTERISTICS

Type: Basic Formation, Compulsory, Elective

Final Degree Project, Internship

Duration: Semestral

Semester/s: 7

Number of ECTS credits: 5

Language/s: Spanish, Catalan, English

DESCRIPTION

SHORT DESCRIPTION AND JUSTIFICATION

The course is highly practical. The students, through practical work individually or in small groups, must acquire the ability to design and conduct experiments in engineering and be able to draw conclusions.

This experimentation in Chemical Engineering is dedicated, by conducting experiments, to enhance the knowledge of mass transfer, reactor design, engineering and process control.

In all cases, students will improve their training to assess and control risks associated with their activity both from the point of view of safety and environmental.

COMPETENCES

- Be able to perform experiments to meet the requirements established in the activity to be performed in the practice of different fields of Chemical Engineering. (CB2, E5)
- Be able to work in a team and to convey information, ideas, problems and solutions to both specialized and non-specialized audiences. (CB4, T1)
- Be able to design processes and experiments to achieve the requirements established in the activity to be carried out in the practice of the different fields of Chemical Engineering. (E10)
- To be able to assess the risks in the use of chemical and biological substances and the processes in which they are involved. (E11)
- Capacity for the design and management of applied experimentation procedures, especially for the determination of thermodynamic and transport properties, and modelling of phenomena and systems in the field of chemical engineering, systems with fluid flow, heat transmission, matter transfer operations, kinetics of chemical reactions and reactors. (TE3)

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PREREQUISITES

According to the program planning and academic regulations.

CONTENTS

1. **Process control.**
 - 1.1. Level and flow control.
 - 1.2. Programmable logic controller, PLC.
2. **Mass transport.**
 - 2.1. Distillation in a plate distillation column.
 - 2.2. Characterization of absorption column.
 - 2.3. Characterization of a plate distillation column.
 - 2.4. Cooling tower water.
3. **Chemical reactors.**
 - 3.1. CSTR Reactor.
 - 3.2. PFR Reactor.
4. **Heat Exchangers**

METODOLOGY

LEARNING ACTIVITIES

Learning Activities	Hours	ECTS Credits	Competences
Lectures	5	0,2	CB2, E5, TE3
Case and Problem-Solving Sessions			
Seminars			
Practical & Lab Work	95	3,3	CB2, E5, E10, E11, CB4, T1, TE3
Presentations			-
Personal study	30	1,2	CB2, E5, E10, E11, CB4, T1, TE3
Assessment Tasks (Exams, Continuous Assessment...)	5	0,3	CB2, E5, E10, E11, CB4, T1, TE3
TOTAL	135	5,0	

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TEACHING METHODOLOGY

Concept exposition sessions: Exposition of contents by presentation or explanation by the professor.

Practical work / laboratory: Period of realization of activities of laboratory or similar (practical with computer, projects, etc.) on the part of the student, under the direct supervision of a professor.

Personal study activities: Realization of reports and preparation of oral presentations.

Assessment activities (exams, follow-up controls): Oral and / or written tests carried out during the lecture period of a subject or once it has been completed.

ASSESSMENT

ASSESSMENT METHODS

Assessment Methods	Weight (%)	Competences
Final Exam	10	CB2, E5, E10, E11, CB4, T1, TE3
Follow-up Activities	10	CB2, E5, E10, E11, CB4, T1, TE3
Reports and Presentations	40	CB2, E5, CB4, T1, TE3
Lab or Field Work	40	CB2, E5, E10, E11, CB4, T1, TE3

LEARNING OUTCOMES

The students will have acquired:

- The capacity to know how to apply their knowledge to their work or vocation in a professional manner and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study. (CB2, E5, TE3)
- The capacity to convey information, ideas, problems and solutions to both specialized and non-specialized audiences. (CB4, T1, TE3)
- The capacity to design processes and experiments to achieve the requirements established in the activity to be carried out in the practice of the different fields of Chemical Engineering. (E10, TE3)
- The capacity to assess the risks in the use of chemical and biological substances and the processes in which they are involved. (E11, TE3)



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QUALIFICATION

The rating for Engineering Laboratory is given by the weighted average of the different assessment methods indicated in the corresponding table above:

10%	Final exam
10%	Follow-up activities made at class time
40%	Papers and presentations
40%	Experimental work

To be able to average, the final exam of each Laboratory must be equal to or greater than 4.0, and the weighted average of the ratings for the Follow-up Activities conducted in class time, Papers, Presentations, and of Experimental Work of each laboratory must be equal to or greater than 5.0, otherwise, the final grade will be directly the worst of partial qualifications.

ASSESSMENT OF THE COMPETENCES

The assessment of the competences will be carried out as indicated in the table of Evaluation Methods.

When two competences are evaluated by two evaluation methods, the rating assigned to each competence is the weighted average of the grade obtained by each evaluation method.

BIBLIOGRAPHY

DOCUMENT RECORD

PREVIOUS REVISIONS

August 2016, Dr. Eduard Barberà and Dr. Eduard Serra

CURRENT REVISION

September 2018, Dr. Eduard Serra