

Degree	Type	Year
Chemical Engineering	OB	2
Chemical Engineering	OB	3

## Contact

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## Teachers

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## Teaching groups languages

You can view this information at the [end](#) of this document.

## Prerequisites

Magnetic fields and waves

## Objectives and Contextualisation

Acquire the fundamental knowledge of circuit theory applied to the study of electrical circuits and systems.

Familiarize yourself with the different types of electric motors and their features.

To know the main properties of semiconductor electronic devices.

Analyze analog and digital circuits for different applications: rectifiers, trimmers, amplifiers, oscillators, logic gates.

## Competences

Chemical Engineering

- Analyse, evaluate, design and operate the systems or processes, equipment and installations used in chemical engineering in accordance with certain requirements, standards and specifications following the principles of sustainable development.
- Apply relevant knowledge of the basic sciences, such as mathematics, chemistry, physics and biology, and the principles of economics, biochemistry, statistics and material science, to comprehend, describe and resolve typical chemical engineering problems.
- Demonstrate knowledge of the standards, legislation and regulations applicable to each situation.
- Develop personal work habits.

## Learning Outcomes

1. Analyse, evaluate and design electronic circuits and systems in the field of chemical engineering.
2. Analyse, evaluate and design single-phase and tri-phase electrical systems in accordance with certain requirements, standards and specifications, following the principles of sustainable development.
3. Apply relevant circuit theory knowledge to solve typical electronic problems in the field of chemical engineering.
4. Develop independent learning strategies.
5. Interpret the standards, legislation and regulations applicable to electronic and electrical systems.
6. Work autonomously.

## Content

### 1.- Direct current.

Electrical magnitudes. Active and passive circuit elements. Series and parallel combinations of passive elements. Superposition theorem. Equivalent circuits (Norton and Thévenin). Circuit analysis.

### 2.- The diode d'unió

Semiconductor. Junction diode. Circuits with diodes: trimmers and rectifiers. Power supplies.

### 3.- The MOS transistors. Digital applications: logic gates.

### 4.- Analog circuits with operational amplifiers.

### 5.- Data acquisition systems

Analog-to-digital and digital-analog converters. Acquisition cards.

### 6.- Corrent alterna

RLC circuits. Impedances. Vector diagrams. Circuit Resolution

### 7.- Single-phase circuits

Single-phase motors. Active, reactive and apparent power. Power factor. Reactive correction. Circuit Resolution

### 8.- Three-phase circuits

Three-phase motors. Star and triangle connections. Active, reactive and apparent power. Power factor. Reactive correction. Circuit Resolution

### 9.- Low voltage electrical installations

Regulation. Electrical panels. Protections

## Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Problem classes	15	0.6	1, 2, 3
Theoretical classes	30	1.2	1, 2, 5
Type: Supervised			
Tutorials	15	0.6	4, 6
Type: Autonomous			
Personal study	30	1.2	1, 2, 4, 5, 6
Problem solving	54	2.16	1, 2, 3, 4, 5, 6

Master classes and applied classes of problem solving  
The virtual campus will be used for communication with students.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Assessment

### Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Activity A	35%	2	0.08	1, 3, 4, 5, 6
Activity B	35%	2	0.08	2, 4, 5, 6
Activity C	15%	1	0.04	1, 3, 4, 6
Activity D	15%	1	0.04	2, 4, 6

#### a) Process and scheduled evaluation activities

The course consists of the following evaluation activities:

- Activity A. Written test on the content of topics 1 and 5. The weight will be 35% of the final grade.
- Activity B. Written test on the content of topics 6 and 9. The weight will be 35% of the final grade.
- Activity C. Team assessment test. The weight will be 15% of the final grade. This activity is not recoverable.
- Activity D. Written test on the content of the topic 6. The weight will be 15% of the final grade. This activity is not recoverable.

To pass the subject, a minimum grade of 4 in activities A and B will be required.

The grade will result from the following expression:

Final grade (continuous assessment) = Activity grade A ( $\geq 4$ ) \* 0.35 + Activity grade B ( $\geq 4$ ) \* 0.35 + Activity grade C \* 0.15 + Activity grade D \* 0.15

b) Scheduling of evaluation activities

The schedule of the evaluation activities will be communicated at the beginning of the subject.

c) Recovery process

Students who have not passed the subject will be able to present themselves to the recovery of activity A and/or B, as long as they have been presented to a set of activities that represent a minimum of two thirds of the total mark for the subject and have an average mark of all the activities of the subject higher than 3.

The recovery note will result from the following expression:

Final grade = Activity grade A ( $\geq 4$ ) \* 0.35 + Activity grade B ( $\geq 4$ ) \* 0.35 + Activity grade C \* 0.15 + Activity grade D \* 0.15

Those students suspended for not having reached the minimum grade of 4 in activities A and/or B, will have a maximum final grade of 4.

d) Qualification review procedure

For each assessment activity, there will be a review place, date and time where the student can review the activity with the teacher. In this context, it will be possible to make claims about the grade of the activity, which will be evaluated by the teacher responsible for the subject. If the student does not appear for the review, this activity will not be reviewed later.

e) Qualifications

With honors. Up to 5% MH of the total number of students enrolled can be awarded. It may only be awarded, at the discretion of the teaching team, to students with a final grade equal to or greater than 9.

A student will be considered non-assessable if he / she has not submitted to any evaluation activity of the subject

f) Irregularities on the part of the student, copying and plagiarism, use of AI

Without prejudice to other disciplinary measures deemed appropriate, the irregularities committed by the student that may lead to a change in the grade of an act of evaluation will be rated with zero. Therefore, copying, plagiarism, cheating, letting yourself be copied, etc. in any of the evaluation activities it will involve suspending it with a zero.

The use of AI in evaluation activities is not authorized

g) Evaluation of repeating students

Students who do not enroll for the first time in the course will have the option of taking the assessment activities during the course or the recovery activities at the end of the course. Only activities A and B are recovered, which represent 7 points of the subject's total.

The grade of the subject will correspond to the following result:

Final grade = Activity grade A ( $\geq 4$ ) \* 0.35 + Activity grade B ( $\geq 4$ ) \* 0.35 + Activity grade C \* 0.15 + Activity grade D \* 0.15

h) Single Evaluation

This subject does not provide for the single evaluation system

## Bibliography

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J.Millman. Microelectrònica. Circuits i sistemes analògics i digitals. Hispano europea. 1991

L. Prat i altres, Circuitos y dispositivos electrónicos. Fundamentos de Electrónica. Edicions UPC. 1999

P. Alcalde San Miguel, Electrotecnia. Paraninfo, 2008

J. A. Navarro, Electrotecnia. Ediciones Ceysa, 2012

S. Catalán Izquierdo, Electrotecnia: instalaciones eléctricas. Editorial Universidad Politécnica de Valencia. 2014

## Software

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## Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	211	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	211	Catalan/Spanish	first semester	morning-mixed
(TE) Theory	21	Catalan/Spanish	first semester	morning-mixed