UAB
Universitat Autònoma de Barcelona

Experimentation in Chemical Engineering I

Code: 102396
ECTS Credits: 4

2024/2025

Degree	Type	Year
2500897 Chemical Engineering	OB	2

Contact

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

Having studied the subject of Balances in Chemical Engineering. It is recommended to be studying the subjects of Chemical Kinetics and Fluid Circulation.

Understand Catalan, since the lab-guidesare written in Catalan.

Objectives and Contextualisation

The main objective of this course is the experimental verification of some basic aspects regarding chemical engineering. These aspects are explained in other subjects of the Degree. These aspects include:

- Mass, energy and heat balances.
- Experimental determination of transport properties: thermal conductivity, diffusivity and viscosity.

In addition, being one of the first lab-courses, special emphasis will be done on writing the reports regarding the experimental work.

Competences

- 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 scientific method to systems in which chemical, physical or biological transformations are produced both on a microscopic and macroscopic scale.
- Assume the values of professional responsibility and ethics required in chemical engineering.
- Develop personal attitude.
- Develop personal work habits.
- Develop thinking habits.
- Observe ethics and professionalism.

- Understand and apply the basic principles on which chemical engineering is founded, and more precisely: balances of matter, energy and thermodynamic momentum, phase equilibrium and kinetic chemical equilibrium of the physical processes of matter, energy and momentum transfer, and kinetics of chemical reactions
- Work in a team.

Learning Outcomes

1. Apply matter and energy balances to continuous and discontinuous systems.
2. Critically evaluate the work done.
3. Develop critical thinking and reasoning
4. Develop curiosity and creativity.
5. Develop systemic thinking.
6. Maintain a proactive and dynamic attitude with regard to one's own professional career, personal growth and continuing education. Have the will to overcome difficulties.
7. Manage available time and resources. Work in an organised manner.
8. Operate common equipment used in the chemical industry.
9. Perform a critical analysis of experimental results and of the overall work done.
10. Perform experiments.
11. Respect diversity in ideas, people and situations.
12. Use measurement elements to determine properties of solids and fluids.
13. Work cooperatively.
14. Work in complex or uncertain surroundings and with limited resources.

Content

The contents of the course are divided into maximum 6 practices that students must do at the laboratory.

- p.1.- heat energy balance.
- p.2.- mechanical energy balance.
- p.3.- mass balance.
- p.4.- conductivity and thermal diffusivity determination.
- p.5.- diffusivity of one component determination.
- p.6.- viscosity determination.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Presentation and operation of practices and the practice laboratory	2	0.08	6
Type: Supervised			
Practices	67	2.68	1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14
Type: Autonomous			
Final exam preparation	3	0.12	1, 2, 3, 5, 7, 9

Reprots preparation	26	1.04	2, 4, 6, 11, 13	

The methodology of the course is based on the development in the laboratory of the practices mentioned above. To carry out the practices, the student will have a script for each practice that must be read and prepared before the start of each practice.

Being an eminently practical learning, attendance at laboratory sessions is mandatory.

General safety rules in the laboratory

It is mandatory to wear a lab coat, material to take notes and the script of the practice to be carried out previously studied. Contact lenses cannot be worn.

The general safety rules in the laboratory can be found in the Virtual Campus. The first day of practical work in the laboratory, not the presentation of the subject, the signed document must be delivered to the professors, which is generated when the base test of "Safety in the laboratories" is passed. The test is in the Virtual Campus.

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

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Attitude at the laboratory	15%	0	0	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
Final exam	15 %	2	0.08	1, 3, 5, 7, 9
Reports	70 %	0	0	1, 2, 3, 5, 7, 9, 13

Process and scheduled evaluation activities

Attendance to laboratory sessions is mandatory to pass the course. In addition, evaluation activities include:

- Presentation of reports of each practice: it is necessary to present all the reports and have 50% of the note of the reports to pass the subject.
- Attitude: Among other aspects, absences will be taken into account. The laboratory grade, apart from attendance, also takes into account the attitude towards the subject (behavior in the laboratory, punctuality, having read the practice beforehand, copying in reports,...).
- Optional global final exam, which can only be presented by those students with 50% of the report grade. The minimum mark of the global exam for a positive score will be 4 out of 10

The final mark will be calculated as 15% attitude in the laboratory, 15% global exam and 70% reports. The maximum grade for those students who do not take the optional global exam will be 8.5 out of 10.

Scheduling of evaluation activities

At the beginning of the subject, together with the distribution of the different shifts, the corresponding delivery dates for the reports will also be marked.

The optional final exam will be done during the Grade exam period according to the schedule established by the coordination.

Ratings

A student will be considered Not Assessable when the laboratory grade does not reach 60% for attendance reasons.

The qualification of Matriculation of Honor, apart from the note that can give access, will take into account the proactivity towards the subject, the manual ability in the laboratory, the understanding of the fundamentals of the practices and their relationship with other subjects and the fluency, reliability and expression of reasoning in situations such as those raised in the practices. A student who has not taken the global exam will not be able to obtain Honors.

If theminimum grade of 50% is not reached in the average of the reports, but the calculation of the final grade is greater than 5, the final grade of the subject will be 4 out of 10.

recovery process

Being an eminently practical subject, no recovery system for a practice or a failed report is foreseen. However, if the grade resulting from the average of the reports is equal to or greater than 4 but less than 5.0 out of 10, this part of the subject may be recovered in an exam that will include all the contents worked on in this part of the subject. It will be necessary to get a grade equal to or greater than 5 out of 10 to be able to make an average with the reports.

Grade Review Procedure

The date of return of the corrected reports will be informed in a timely manner, so that the students who wish to can review the correction and improve the aspects that are necessary for the following deliveries.

Irregularities by the student, cheating and plagiarism

Without prejudice to other disciplinary measures deemed appropriate, and in accordance with current academic regulations, irregularities committed by the student that may lead to a variation in the grade of an evaluation act will be graded zero. Therefore, copying or allowing a practice or any other assessment activity to be copied will imply a zero (0) in the attitude mark and, therefore, fail the subject with a mark of 3 out of 10. In addition, the student will not be able to continue doing the practices in the current course.

Evaluation of repeating students

Repeating students who are repeating for cheating must repeat the subject again as if they were doing it for the first time.

The rest of the repeating students have two possibilities:

Form a pair with another repeating student and repeat only the reports of those practices that, the previous course, were qualified with a grade lower than 6. It will not be necessary forthem to go to the laboratory and to make the reports they will have to use their own data from the previous course. It will also be necessary to present them compulsorily in the final exam. To pass the subject it will be necessary for them to obtain at least 6 out of 10 for each of the reports they make and a minimum of 5 out of 10 for the final exam. The calculation of the grade will be made from: 70% average of the grade of all the reports and 30% of the exam grade. In no case, in this way, they will be able to obtain the qualification of Matriculation of Honor.

Bibliography

The bibliography will be the one indicated in the practice scripts.

Software

MS Word, MS Excel

Language list

Name	Group	Language	Semester	Turn
(PLAB) Practical laboratories	211	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	212	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	213	Catalan	second semester	morning-mixed