UAB
Universitat Autònoma de Barcelona

Reactors I

Code: 106053
ECTS Credits: 6

2025/2026

Degree	Type	Year
Chemical Engineering	OB	3

Contact

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Teaching groups languages

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

Prerequisites

In order to take this subject, it is recommended that you should previously have passed the subjects of Mass and Energy balances on Chemical Engineering and Chemical Kinetics.

Objectives and Contextualisation

The objective of the subject of Reactors is that the student would be able to analyze, evaluate, design and operate ideal and homogeneous chemical reactors according to certain requirements, norms or specifications.

Competences

- Demonstrate knowledge of the different reaction, separation and processing operations for materials, and transport and circulation of fluids involved in the industrial processes of chemical engineering.
- Develop personal work habits.
- Develop thinking habits.
- 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

Learning Outcomes

1. Apply the basic flow principles to chemical reactors.
2. Apply the basic principles on which chemical reactors are based.
3. Apply the concepts of homogenous chemical kinetics.
4. Develop critical thinking and reasoning
5. Identify, analyse and resolve balances of matter in a stationary or non- stationary state, with or without a chemical reaction, in simple chemical processes.
6. Monitor the advance of a chemical reaction using the most suitable methodology.
7. Obtain and apply the design equations for ideal isothermal reactors.
8. Practice the fundamental laws of thermodynamics in chemical process engineering problems.

9. Work autonomously.

Content

6.1 Design equation of a packed bed catalytic reactor

6.2 Pressure drop in catalytic reactors

6.3 Catalyst deactivation

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Master classes	30	1.2	3, 1, 2, 5, 6, 7, 8
Problems seminars	15	0.6	3, 1, 2, 4, 5, 6, 7, 8, 9
Type: Supervised			
Tutorials	9	0.36	3, 1, 2, 5, 6, 7, 8
Type: Autonomous			
Autonomous student learning	70	2.8	3, 1, 2, 4, 5, 6, 7, 8, 9
Collaborative learning	20	0.8	3, 1, 2, 4, 5, 6, 7, 8

Autonomous student learning: Consists of the individual work of each student and encompasses: the resolution of problems, the search for information, the reading of books, articles and cases and individual study.

Collaborative learning: It consists of carrying out group work on a part of the subject, at the teacher's suggestion.

Master classes: This consists of the teacher's presentation. Students will be shown the basic concepts and techniques with indications on how to complement and deepen the learning of the subject.

Problems seminars: Students will solve problems related to the contents exposed in the master classes. The aim is to encourage the active participation of students in these activities.

Tutorials: Meetings of small groups of students with the teacher to clarify doubts, give advice on the writing of reports, follow up group work or deal with any specific issue.

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
Reactor design task	15%	0	0	3, 1, 2, 4, 5, 6, 7, 8

Reactor design test	25%	2	0.08	3, 1, 2, 4, 5, 6, 7, 8, 9
Synthesis exam	60%	4	0.16	3, 1, 2, 4, 5, 6, 7, 8, 9

Assessment

- Process and scheduled evaluation activities

The course consists of the following evaluation activities:

Activity A, Reactor design test, 25% on the final grade. This exam will be done in person in November.

Activity B, Reactor design task, 15% on the final qualification. This work will be carried out in groups and will have to be presented in written form and in English.

Activity C, Synthesis test, 60% of the final grade. This exam will be done in person in January.

Please note that activitiy B is not recoverable.

This subject/module does not provide for the single assessment system.

The use of AI is prohibited in any assessable activity.

- Programming assessment activities

The calendar of evaluation activities will be given during the first week of classes and will be made public through the Campus Vitual and the website of the Escola d'Enginyeria.

- Recovery process

75% of the final grade can be recovered in a classroom exam with theory and problems. In this make-up test, the student will be tested on all the subject matter of the course.

- Grade reviewprocedure

For each assessment activity, a review date and time will be indicated where the student will be able to review virtually the activity with the teacher. If the student does not show up for this review, this activity will not be reviewed later.

- Special qualifications

Honor's registration. Granting a grade of honor's registration is the decision of the teacher responsible of the subject. The UAB regulation indicates that the MH can only be granted to students who have obtained a final grade equal to or greater than 9.0. The teacher can grant up to 5% of MH of the total number of students enrolled.

- Plagiarism

Total or partial plagiarism of any of the assessment activities will automatically be awarded a "fail" (that is, zero) for the plagiarised item.

Plagiarism is copying from unidentified sources and presenting this as original work (this includes copying phrases or fragments from the internet and adding them without modification to a text which is presented as original).

Plagiarism is a serious academic offence. It is essential to respect the intellectual property of others, to identify any source uses, and to take responsibility for the originality and authenticity of all work produced.

- Assessment of repeating students

The repeating student will be evaluated with the same procedure as any other student.

Bibliography

1) H. Scott Fogler. Elements of chemical reaction engineering 4th edition solutions

2) O. Levenspiel. Chemical Reactor Engineering.

Software

MS Office

Polymath 6.0

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	first semester	morning-mixed
(PAUL) Classroom practices	212	Catalan	first semester	morning-mixed
(SEM) Seminars	211	Catalan	first semester	morning-mixed
(SEM) Seminars	212	Catalan	first semester	morning-mixed
(TE) Theory	21	Catalan	first semester	morning-mixed