UAB
Universitat Autònoma de Barcelona

Fluid Dynamics

2026/2027

Code: 106048
Credits: 9

Degree programme	Type	Course
Chemical Engineering	OB	2

Contact lecturer

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Teaching staff

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Group languages

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

Prerequisites

To have attended the subject 106050 Chemical Engineering Fundamentals

Objectives

The main objective is to select and design equipment based on the circulation of fluids existing in any industrial plant.

Other more specific objectives:

- Apply the mechanical energy balance to the study of the fluid flow.
- Study and dimension the equipment for the transport of incompressible fluids.
- Know the necessary instrumentation or based on the fluid flow.
- Expand the application of the mechanical energy balance to the circulation of compressible fluids.
- Understand the foundation of unit operations based on the fluid flow.
- Design the equipment of the most relevant unit operations.
- Consolidate theoretical concepts through experimentation in laboratory assemblies.

Learning outcomes

1. Identify, analyse and resolve mechanical energy and matter balances.
2. Perform a critical analysis of experimental results and of the overall work done.
3. Apply scientific method to perform macroscopic balances of matter, energy and momentum.
4. Work autonomously.
5. Work cooperatively.
6. Students must have and understand knowledge of an area of study built on the basis of general

secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.

Contents

4.4.- Filtration

4.5.- Sedimentation

Lab work:

- Mechanical energy balance
- Loss of load in accidents
- Fixed / fluidized beds
- Rotodynamic machines
- Filtration

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Lab work	35	1.4	
Problem solving in class	40	1.6	
Finding information	10	0.4	
Theoretical fundamentals	20	0.8	
Lab work report	35	1.4	
Study	55	2.2	
Equipment selection	10	0.4	
Mentoring	4	0.16	
Numerical work	5	0.2	

The fundamental concepts will be presented through videos and teaching material on the Virtual Campus.

The classes will require the active participation of the students who will have to apply the concepts to specific cases and the doubts will be resolved.

Problem classes will be used to solve model problems.

Students will have to study autonomously the reports of equipment description and will have to answer the questions formulated through questionnaires of the virtual Campus

Completion (mostly in class) by students of a numerical detail work of an installation.

The comunicaction with students will be through Campus Virtual or e-mail.

For this subject, the use of Artificial Intelligence (AI) technologies is allowed exclusively in [support tasks, such as bibliographic or information searches, text correction or translations, other specific situations in which it is considered]. The student must clearly identify which parts have been generated with this technology, specify the tools used and include a critical reflection on how these have influenced the process and the final result of the activity. The lack of transparency of the use of AI in this assessable activity will be considered a lack of academic honesty and may lead to a partial or total penalty in the grade of the activity, or greater sanctions in serious cases.

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	Weight	Hours	ECTS	Learning outcomes
Exam block A	30 %	4	0.16	1, 3, 6
Lab work	25 %	1	0.04	2, 4, 5
Equipment selection (multiple choice exams)	5 %	1	0.04	4, 6
Block B exam	30 %	4	0.16	1, 3, 6
Numerical work	10 %	1	0.04	3, 4, 5, 6

The subject is divided into three parts: part A (topics 1 and 2), part B (topics 3 and 4) and part C (laboratory exercises)

The activities to be evaluated are:

- A consistent numerical work in designing a simple installation through which a fluid circulates + examination, unrecoverable.
- Test-type tests on team selection formulated through the Virtual Campus, unrecoverable.
- 2 Seminars that consist of solving 1 problem, unrecoverable.
- 2 Partial tests (Ai B)
- Practices (reports + exam)

The mark of the seminars will generate a factor (1 - 1.1), m=1+seminar mark/1000

The final grade will be calculated according to the expression:

Final grade = (25% bloc A + 25% bloc B + 5 % tests + 10% numerical work + 25 % practicals) * m.

To pass block A and block B you need to get 50% between the theory exam and the problems, otherwise you will have to recover the block not passed.

Each exam will have a theory part and a problem part. Only the problem part will be corrected if a mark greater than or equal to 40% is obtained in the theory part.

After the recovery, grade of part A can be compensate with grade of part B with a minimum of 40%, which means to be necessary to obtain 50% in average in part A and B to calculate the final grade. You must obtain a minimum of 40% in the practicals.

This subject does not include a single assessment system.

b) Practicals

A notebook is required

The practice block is evaluated as follows: 70% reports, 15% exam, 15% laboratory (behavior in the laboratory, having read the script, attendance on time, etc.)

To be able to average the practice block, you must get at least a 30% in the exam.

In order to be able to average the practice block, at least a 40% must be subtracted from the average of the reports.

Unexcused absences subtract1 point from the laboratory grade.

Arriving late unjustifiably subtracts 0.5points from the laboratory grade.

c) Programming of assessment activities

Evaluable activities will be announced through the Virtual Campus.

d) Recovery procedure

No requirements

e) Qualification review procedure

For each test and retakes, theday, time and place will be indicated when the notes are published.

f) Qualifications

UAB regulations indicate that MH can only be granted to students who have obtained a final grade equal to or higher than 9.00. Up to 5% of MH of the total number of enrolled students can be awarded.

g) Irregularities by the student, copying and plagiarism.

Without prejudice to other disciplinary measures deemed appropriate, irregularities committed by the student that may lead to a change in the grade of an assessment act will be graded with a zero. Therefore, copying, plagiarism, deception, allowing copying, etc. in any of the assessment activities will involve failing it with a zero. Assessment activities qualified in this way and by this procedure will not be recoverable. If it is necessary to pass any of these assessment activities to pass the subject, this subject will be suspended directly, with no opportunity to recover it in the same course.

The copy may be detected during the test, but especially during the correction, so that activity with identical versions will be cancelled.

h) For this subject, the use of Artificial Intelligence (AI) technologies is allowed exclusively in [support tasks, such as bibliographic or information search, text correction or translations and other specific situations in which it is considered]. The student must clearly identify which parts have been generated with this technology, specify the tools used and include a critical reflection on how these have influenced the process and the final result of the activity. The lack of transparency of the use of AI in this assessable activity will be consideredalack of academic honesty and may lead to a partial or total penalty in the grade of the activity, or greater sanctions in serious cases.

i) For this subject is not considered the single unique evaluation system.

Bibliography

J.M. Coulson, J.F. Richardson Chemical Engineering, V. 1 (1991), V. 6 (1983) Pergamon Press

W.L. Mc Cabe, J.C. Smith, P. Harriot Unit Operations of Chemical Engineering, 4th edition.McGraw-Hill Book Company, New York (1985)

E. Costa Novella Ingeniería Química 3. Flujo de fluidos. Alhambra Universidad, Madrid (1985)

R.H. Perry, D. Green Perry's Chemical Engineers' Handbook, 6th edition McGraw-hill, New York (1984)

O. Levenspiel Flujo de Fluidos. Intercambio de Calor Ed. Reverté, Barcelona (1993)

F.M. White Fluid Mechanics, 3th edition. McGraw-Hill, New York (1994)

N. de Nevers Fluid Mechanics for Chemical Engineers, 2nd edition. McGraw-Hill, New York (1991)

R. Darby Chemical Engineering Fluid Mechanics. Marcel Dekker, New York (1996)

Robert L. Mott Mecànica de fluidos aplicada, 4ª edición, Prentice Hall, Mèxico (1996)

A través de la biblioteca se puede consultar la versión electrónica.

Ch. J. Geankoplis Transport Processes and Unit Operations, 3ª edición, Prentice Hall, New Jersey (1993)

Teniu disponible el llibre electrònic MECÁNICA DE FLUIDOS 7ED, de Robert Mott que es recomana a l'assignatura Circulació de fluids.

Quan entres des de l'enllaç per anar al llibre, a:

Ingebook - MECÁNICA DE FLUIDOS 7ED - (uab.cat)

Veureu que la coberta del llibre inclou un enllaç al peu que diu: Leer Libro.

Clicant-hi entres al llibre.

Aquest llibre no es pot descarregar, les condicions de consulta dels ebooks les marca cada proveïdor, i per cada llibre. De vegades permeten fer més o menys coses (descarregar, fer anotacions...) i aquest només permet la lectura en línia, has d'anar passant les pàgines a la pantalla.

Software

No special software

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this link. To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	21	Catalan	annual	morning-mixed
(PAUL) Classroom practices	211	Catalan	annual	morning-mixed
(PLAB) Practical laboratories	211	Catalan	annual	morning-mixed
(SEM) Seminars	211	Catalan	annual	morning-mixed
(PLABs) Suport a les pràctiques de laboratori	211	Catalan	annual	morning-mixed
(PAUL) Classroom practices	212	Catalan	annual	morning-mixed
(PLAB) Practical laboratories	212	Catalan	annual	morning-mixed
(SEM) Seminars	212	Catalan	annual	morning-mixed

(PLAB) Practical laboratories	213	Catalan	annual	morning-mixed
(PLABs) Suport a les pràctiques de laboratori	213	Catalan	annual	morning-mixed
(PLAB) Practical laboratories	214	Catalan	annual	morning-mixed
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(PLABs) Suport a les pràctiques de laboratori	215	Catalan	annual	morning-mixed