Physics

Code: 106043
ECTS Credits: 9

2025/2026

Degree	Type	Year
Chemical Engineering	FB	1

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

Knowledge of mathematics at the pre-university level, in particular basic algebra, systems of equations, functions of a single variable, derivatives and integrals of the most common functions, vectors, vector operations (addition, subtraction, scalar product, vector product).

Objectives and Contextualisation

Apply relevant knowledge from physics to allow understanding, describing and solving of typical problems in Chemical Engineering.

Competences

- 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.
- Develop personal work habits.
- Develop thinking habits.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- 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.

Learning Outcomes

1. Analyse concepts related with particle systems, kinematics and dynamics.
2. Develop critical thinking and reasoning
3. Distinguish between scalar, vector and tensor magnitudes.
4. Identify, analyse and calculate magnitudes in the area of engineering using calculation tools in different variables.
5. Make one's own decisions.
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.
7. Work autonomously.

Content

1. Measurement systems
2. Mathematical description of linear and circular movement
3. Forces and torques. Newton's laws
4. Work and Energy
5. Particle systems: Conservation of energy and linear and angular momentum
6. Oscillations
7. Electrostatics
8. Magnetism

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Exercise resolution sessions	23	0.92	1, 3, 4, 5, 6, 7
Lectures	45	1.8	1, 2, 3, 4, 6
Seminars	2	0.08	1, 2, 3, 4, 6
Type: Autonomous			
Exercise resolution	61	2.44	1, 3, 4, 5, 6, 7
Study	78	3.12	1, 2, 3, 4, 6, 7
Tutorials with professors	3	0.12	1, 2, 3, 4, 6

- The teaching methodology will consist of learning activities in the format of lectures and seminars as well as sessions in smaller groups where exercices will be solved.

  The lectures and seminars will develop the theoretical basis relating the physical world with the mathematical description that allows us to analyze it. This theoretical base will be illustrated with practical examples.

Group exercise sessions will deepen the application of the theoretical base to the analysis of practical problems of the physical world. These sessions will be guided by a professor, but they must have a high level of participation by 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

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Assignment (individual or collective)	10%	1	0.04	1, 2, 3, 4, 5, 6, 7
Continuous Evaluation Tests	75%-90%	6	0.24	1, 2, 3, 4, 6
Ejercicios campus virtual	0%-15%	6	0.24	1, 2, 3, 4, 5, 6, 7

The content of this course is divided into the following parts:

Part 1 (30% of the final grade): units, kinematics, and dynamics
Part 2 (30% of the final grade): work and energy; collisions and systems of particles
Part 3 (30% of the final grade): electrostatics and magnetism
Part 4 (10% of the final grade): oscillations

Each of the first three parts, which account for 30% of the final grade, will be assessed as follows:

- Mandatory online quiz, required in order to take the partial exam (0% of the final grade)
- Online exercises to be submitted and assessed (optional: 5% of the final grade if the partial exam is passed)
- Partial exam (25% or 30% of the final grade, depending on whether the previous point is applied)

The partial exams will consist of solving exercises and/or answering questions in writing, within a limited time. This will allow students to demonstrate their understanding of the theoretical and problem-solving content and the acquisition of competencies.

Students who take a partial exam but do not pass it, and who achieve more than 25% of the maximum course grade, may take a make-up exam for that part of the syllabus at the end of the course. The maximum grade for the make-up exam will be 5 out of 10, and it will count for 30% of the final grade.

Students who do not attend a partial exam without a justified reason will receive a Not Assessed status. If, due to exceptional and properly documented reasons, a student cannot attend a partial exam, they may take it on the day of the make-up exam. The documents justifying the absence must be submitted as soon as possible.

The online exercises will be peer-assessed by students using a rubric provided by the teaching staff, who will monitor the peer assessment process.

The assessment of the fourth part will consist of a project submission, which will count for 10% of the final grade. The projectwill involve analyzing a physical system and submitting the results before a set deadline. This will allow students to demonstrate their understanding of the theoretical and problem-solving content and the acquisition of competencies.

The teaching staff may require that, in order to submit the project for the fourth part, students must have completed an online quiz on the topic. Additionally, it may be announced one week in advance that class

attendance is mandatory for this topic.
Note: The oscillations topic (Part 4) is usually taught before the electrostatics and magnetism topics.

For each assessment activity, a location, date, and time for review will be announced, during which students may review the assessment with the teaching staff. In this context, students may submit grade appeals, which will be evaluated by the teaching staff. If a student does not attend the review session, the assessment will not be reviewed later.

The final grade for the course is the weighted average of the various assessment activities. The course is considered passed if the student obtains 50% or more of the maximum grade. The criteria for awarding Honors Distinction will follow the regulations of the UAB.

General communication with students will take place through the Aula Moodle platform.

Without prejudice to other disciplinary measures deemed appropriate, and in accordance with current academic regulations, any irregularities committed by students that may lead to a change in the grade of an assessment activity will result in a zero. Therefore, copying or allowing copying in a submission, continuous assessment test, or make-up exam will result in a zero, and if passing that activity is required to pass the course, the entire course will be failed. Assessment activities graded in this way cannot be retaken, and the course may be failed directly without the opportunity to recover it in the same academicyear.

NOTES: This course does not offer a single final assessment option. There is also no differentiated treatment for students taking the course for a second time. The use of Artificial Intelligence is not allowed.

Bibliography

Física per a la ciència i la tecnologia [Recurs electrònic] / Paul A. Tipler, Gene Mosca ; obra coordinada per David Jou i Mirabent i Josep Enric Llebot Rabagliati
Autor Tipler, Paul Allen, 1933-
Publicació Barcelona [etc.] : Reverté, cop. 2010
Recurs electrònic
ISBN
9788429144314 (o.c.)
9788429144321 (v. 1)
9788429144338 (v. 2)
9788429193701 (v.1)
9788429193718 (v.2)

Practically all of the Specific Competences of the subject are briefly explained in Wikipedia (http://es.wikipedia.org/wiki/Portal:Física) and in a more complete way although in English in HyperPhysics (http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html)

Software

There is no software required for the course. It is convenient to use spreadsheets (LibreOffice Calc, Google Sheets, Microsoft Excel, etc.) or online pages that generate graphs (desmos.com, geogebra, etc.) to facilitate the solution of some exercises.

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