UAB
Universitat Autònoma de Barcelona

Physics

Code: 106043
ECTS Credits: 9

2024/2025

Degree	Type	Year
2500897 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	9	0.36	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 of exercises (individual or collective)	10%	1	0.04	1, 2, 3, 4, 5, 6, 7
Continuous Evaluation Tests	90%	6	0.24	1, 2, 3, 4, 6

NOTE: This subject does not provide for the single assessment system.

The competences of the subject will be evaluated by the Continuous Evaluation method, which will include two types: Delivery of Exercises (individual or collective) and Continuous Evaluation Tests.

The Continuous Assessment will be carried out in a total of 4 actions distributed throughout the study period. The types of actions will be:

- 1 Delivery of Exercises (individual or collective) that will have a weight of 10% in the final grade.
- 3 Continuous Assessment Tests that will each have a weight of 30% in the final grade.

The Delivery of exercises will focus on carrying out an analysis of a physical system before a deadline and delivering it in hand-written form or by electronic means. This will allow students to demonstrate their understanding of the contents of theory and exercise solving classes and the acquisition of skills.

The Tests will consist of solving exercises and / or answering questions in writing or by telematic means, with a limited time. This will allow students to demonstrate their understanding of the contents of theory and exercise solving classes and the acquisition of skills.

Grading of the Continuous Assessment Tests and the Deliveries will take into account the correct application ofthe contents of the subject to solve the proposed exercises and also the way in which the solutions and results are presented. In particular, solutions will be required to be presented in an orderly manner, with an appropriate level of detail, and to follow a logical flow of resolution.

The place, time and date of the Continuous Assessment Tests will be announced through the Moodle Classroom at least one week in advance. Also, the place, time and date to deliver the Individual Delivery will be announced through the Moodle Classroom at least one week in advance.

The place, time and date of the review of the results of the Continuous Assessment Tests will be announced through the Moodle Classroom 48 hours in advance.

The condition to pass the course will be to obtain at least 50% of the maximum score. If the final score does not reach 50%, but it is above 20%, provided that the student has taken all Continuous Assessment Tests, she or he will have another opportunity to pass the subject through a recovery exam that will be held on the date set by the degree coordinator.

The Non-Assessable condition will be applied to students who do not take a Continuous Assessment Test without just cause. If due to exceptional causes and duly justified with documents, someone can not attend a Continuous Assessment Test, it can be done on the day of the recovery exam. The documents, which justify the absence in the test, must be submitted as soon as possible.

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 act of evaluation will be rated with a zero. Therefore, copying a Delivery of Exercices, Continuous assessment Test, or the recovery test, or letting them be copied, will involve suspending with a zero, and if it is necessary to pass it to pass the course, the whole subject will be suspended. The evaluation actions assessed in this way will not be recoverable, and therefore the subject may be directly suspended without the opportunity to recover it in the same academic year.

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.)
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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.

Language list

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	second semester	morning-mixed