UAB
Universitat Autònoma de Barcelona

Physics I

Code: 105035
ECTS Credits: 6

2024/2025

Degree	Type	Year
2502444 Chemistry	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

There are no official prerequisites. However, it is assumed that the student has acquired the basic knowledge tau
vectors).
Students who have not studied physics previously are strongly encourag

Objectives and Contextualisation

This subject aims to teach students the basic principles of nature, from the smallest (atomic nucleus and element
qualitative and quantitative, of physical phenomena. Students will acquire
Moreover, this learning aims to help students to reason critically and to a

Competences

- Adapt to new situations.
- Apply knowledge of chemistry to problem solving of a quantitative or qualitative nature in familiar and professional fields.
- Communicate orally and in writing in one's own language.
- Have numerical calculation skills.

- Learn autonomously.
- Manage, analyse and synthesise information.
- Obtain information, including by digital means.
- Propose creative ideas and solutions.
- Reason in a critical manner
- Resolve problems and make decisions.
- Show an understanding of the basic concepts, principles, theories and facts of the different areas of chemistry.
- Work in a team and show concern for interpersonal relations at work.

Learning Outcomes

1. Adapt to new situations.
2. Apply knowledge of physics to solve chemistry problems.
3. Communicate orally and in writing in one's own language.
4. Describe the concepts, principles and theories of physics to understand and interpret the structure of matter and the nature of chemical processes.
5. Have numerical calculation skills.
6. Learn autonomously.
7. Manage, analyse and synthesise information.
8. Obtain information, including by digital means.
9. Propose creative ideas and solutions.
10. Reason in a critical manner
11. Resolve problems and make decisions.
12. Work in a team and show concern for interpersonal relations at work.

Content

Introduction
1. History of Physics
2. Physical Magnitudes. Units. Dimensional analysis

Kinematics of 1 particle
1. Kinematics in 1 dimension
2. Kinematics in space
3. Concept of relative movement

Dynamics of 1 particle
1. Laws of Newton
2. Forces: definition and type
3. Application of the laws of Newton

Work and energy of 1 particle
1. Definition of work and power
2. Kinetic energy of 1 particle
3. Potential energy of 1 particle
4. Mechanical energy of 1 particle
5. Generalized theorem of conservation of energies

Particle systems
1. Description
2. Mass center
3. Definition of moment of inertia

4. Dynamics of the particle system
5. Work and energy of the particle system
6. Collisions

Rigid body
1. Description
2. Movements of translation and rotation
3. Mass center and moment of inertia
4. Dynamics of rigid body
5. Work and energy of the rigid body
6. Roller movement
7. Static equibrium

Fluids

1. Basic concepts
2. Hydrostatic
3. Hydrodynamics. Ideal and viscous fluid

Radioactivity
1. Atomic structure
2. Link energy and mass defect
3. The phenomenon of radioactivity. Type
4. Law of radioactive decay
5. Induced nuclear reactions. Fission and fusion

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lectures	36	1.44	1, 2, 3, 4, 7, 9, 10, 11, 12
Practicum	13	0.52	1, 2, 3, 4, 7, 9, 10, 11, 5, 12
Type: Autonomous			
Study and independent work	52	2.08	1, 2, 6, 4, 7, 8, 9, 10, 11, 5
Team work	25	1	1, 2, 6, 3, 4, 7, 8, 9, 10, 11, 5, 12

Theory classes
The teacher will explain the content of the syllabus with the support of audiovisual material that will be available to students in the Virtual Campus of the subject in advance at the beginning of each of the subjects of the course.
It is important that the student prepares the session in advance, based on this material and the bibliography. The teacher will combine the use of transparencies with developments on the board. Students are encouraged to study in depth the concepts using complementary material (web pages, videos, applets, ...), which will be proposed in the Virtual Campus. The professor will solve some practical cases in order to exemplify the theory and will try to promote the student participation during classes.

Problem classes
The teachers will solve selected problems from the list that the student will previously have on the Virtual

Campus. It is very convenient for students to work on the problems before classes. Sessions are participatory, and intended to solve doubts or to present alternative procedures. In some cases the students will solve a problem in class and will have to deliver it at the end of the class.

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
Extra activities	20%	15	0.6	1, 2, 6, 3, 4, 7, 8, 9, 10, 11, 5, 12
Partial exams	80%	9	0.36	1, 2, 3, 4, 7, 9, 10, 5

There will be two independent exams (partial exams). These exams correspond to 80% of the final mark of the subject. In addition, complementary evaluation activities (follow-up tests, exercise delivery, class activities ...) will be carried out. These will correspond to 20% of the final grade of the subject.

Extra exam
In the case in which the semester's mark does not exceed 5, the student will have the option of submitting to an extra exam where the note of the partial examns may be uploaded.

Not presented
It is considered Not Presented the student that has not been submitted to the second partial nor to any extra exam.

In order to be able to complete the final exam, students must have participated in assessment activities throughout the course that are equivalent to 2/3 of the subject mark.

Single evaluation modality

People who decide to join the option of single assessment modality must take a final test that will consist of an exam of the syllabus of the entire subject, to be carried out on the day that the rest of the students take the second exam of the continous evaluation. The qualification of the student who performs the continuous assessment will be the mark of this test. If the final mark does not reach 5, this student has another opportunity to pass the subject through the extra exam that will be held on the date set by the deputy coordination of the degree. The final qualification will then be the mark of this second test.

Bibliography

Theory::
P. A. Tipler y G. Mosca. Física. Reverté. Barcelona. (2010, 6ª ed.)
D. E. Roller, R. Blum. Mecánica, Ondas y Termodinámica (vol. 1).Reverté. Barcelona (1986)
F. W. Sears, M.W. Zemansky, H.D. Young. Física universitaria. Addison-Wesley (1986)

Exercises:
S. Burbano de Ercilla, E. Burbano García, G. Diaz de Villegas Blasco. Física general: problemas. Tébar 27ª ed. (1991).
F. A. González. La física en problemas. Madrid, Tebar-Flores (1997)
J. Aguilar Peris, J. Casanova Col. Problemas de Física General. 4ª ed. Madrid, editorial Alhambra (1981)
D. Jou, J.E. Llebot, C. Pérez-García. Física para las ciencias de la vida. McGraw-Hill (2009, 2ª ed.)

Web URL:
You will find them in the Virtual Campus of this subject.

Software

This subject does not require of any specific software.

Language list

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	1	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	2	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	3	Catalan/Spanish	first semester	afternoon
(PAUL) Classroom practices	4	Catalan/Spanish	first semester	afternoon
(TE) Theory	1	Catalan	first semester	morning-mixed
(TE) Theory	2	Catalan	first semester	morning-mixed