

Physics

Code: 100810
ECTS Credits: 6

2025/2026

Degree	Type	Year
Biology	FB	1

Contact

Name: Javier Cristin Redondo

Email: javier.cristin@uab.cat

Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

As this is a first-year course, there are no specific prerequisites required to take it.

It is recommended to take the preparatory Physics course offered by the Faculty, as it helps with understanding the subject. Although the course builds on high school knowledge, a review of fundamental concepts is carried out throughout the semester.

Objectives and Contextualisation

- The Physics course is a basic and compulsory subject within the Biology degree curriculum. Its main objective is to provide the fundamental knowledge and analytical and methodological tools necessary to develop the transversal competencies required in life sciences studies.
- Specifically, the course aims to help students understand the fundamental laws of physics that govern natural systems, with special emphasis on their application to biological processes. This approach contributes to a better understanding of phenomena such as fluid movement in biological systems, the functioning of the senses, and the interactions involved in cellular dynamics.
- Additionally, the course promotes the development of general skills (such as critical thinking and independent work), transversal skills (such as identifying and analyzing the key elements of a scientific problem), and specific skills (such as applying physical concepts to the understanding of biological systems). This set of competencies is essential in the training of future biologists.

Learning Outcomes

1. CM03 (Competence) Judge narratives and images used to facilitate communication and the conceptualisation of concepts in Physics that contain gender stereotypes.
2. CM04 (Competence) Explain popular articles on physics applied to biology.
3. KM05 (Knowledge) Explain the basic principles of physics applied to biology.
4. KM06 (Knowledge) Identify some current frontiers of biophysics.
5. KM07 (Knowledge) Describe how physical theories are used to pose, with greater precision, problems in biology.
6. SM03 (Skill) Solve simple physics problems related to situations of biological interest.
7. SM04 (Skill) Apply physical theories in the approach and resolution of biological problems.

Content

- Mechanics and Energy
 - Quantities, Uniform and accelerated motion, Newton's Laws.
 - Work, Potential energy, Mechanical energy.
- Fluids
 - Hydrostatics: Pressure, Archimedes' Principle.
 - Hydrodynamics: Bernoulli's Equation, Poiseuille's Law, Sedimentation.
- Thermodynamics
 - Temperature, Heat.
 - Phase changes, Conduction, Convection, Radiation.
- Electromagnetism
 - Coulomb's Law, Electric potential and field.
 - Electric current, Ohm's Law.
- Waves and Sound
 - Wave propagation, Standing waves.
 - Doppler effect, Sound intensity.
- Optics
 - Reflection, Refraction.
 - Lenses, Image formation.
- Radiation
 - Decay, Physical dose.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Theory classes	35	1.4	CM03, CM04, KM05, KM06, KM07, SM04, CM03
Type: Supervised			
Problem solving classes	20	0.8	KM07, SM03, SM04, KM07

Type: Autonomous

Personal study, problems solving, classwork, participation in forums on the virtual campus	86	3.44	KM06, SM03, SM04, KM06
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The course combines in-person classroom activities with virtual activities on the online campus, through task submissions, exercises, and participation in forums. These activities include guided, supervised, and independent work.

The theoretical classes introduce basic physics concepts adapted for first-year students, with a special focus on applications in biology.

The problem-solving sessions serve to illustrate the biological application of the equations and concepts studied in theory. Students will prepare some problems in advance, while the instructor will work through the most relevant cases and provide support to clarify doubts and difficulties.

At all times, students have access to support materials based on the course syllabus, where they can consult the course content, the schedule of continuous assessment and guided learning activities, as well as the recommended bibliography.

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	Weighting	Hours	ECTS	Learning Outcomes
Classwork and exercises	20%	2	0.08	CM03, CM04, KM05, KM06, KM07, SM03, SM04
First midterm exam	40%	2.5	0.1	KM05, KM07, SM03, SM04
Retake exam	Allows to raise the grade obtained in the midterm exams	2.5	0.1	
Second midterm exam	40%	2	0.08	KM05, KM07, SM03, SM04

The achievement of competencies by students will be assessed through three types of activities, each with a specific weight in the final grade, in addition to an additional exam for recovery or grade improvement:

- Partial assessment tests (80%): Two written exams covering both theoretical and practical content will be administered during the course. Each exam will carry a weight of 40% of the final grade. To average with the rest of the grades, students must obtain a minimum score of 4 out of 10 on each of the two exams.
- Continuous assessment activities (20%): Throughout the semester, students will be offered activities such as solving additional exercises, Moodle quizzes, in-class activities, or participation in forums. These activities will collectively account for 20% of the overall grade. No minimum score is required for these activities.

- Recovery exam: Intended for students who did not pass one or both partial exams or wish to improve their grade. Only students who have taken both partial exams may sit for the recovery exam. If the result improves the original partial exam grade, the new grade will replace the previous one in all respects (with the same minimum score requirement to be included in the average).

The subject will be considered passed when the overall grade is equal to or greater than 5 out of 10, provided that the specific requirements of each assessment activity are met.

Repeating students must follow the same assessment system as newly enrolled students.

Honors distinctions may only be awarded to students with a final grade equal to or greater than 9, and at a maximum rate of one per every 20 enrolled students.

Single assessment

Students who choose the single assessment option will take a comprehensive exam on the same day as the second regular partial exam. If they do not pass it (score below 5 out of 10), they will be entitled to a recovery exam on the same date as the recovery exam for the rest of the students.

Bibliography

Different reference books are proposed for most of the topics, including some of a basic nature for general consultation and others advanced for students who would like to expand their knowledge.

- D. Jou, J E Llebot i C Pérez-García, Física para las ciencias de la vida, segona edició, Mc Graw Hill, 2009.
- J. W. Kane i M. M. Sternheim, Física, Reverté, 1989.
- P.A. Tipler, Física (2 Volumes), Ed. Revert, 1998.
- R. Cotterill, Biophysics: An Introduction, John Willey & Sons, LTD. 2002.
- P. Davidovits, Physics in Biology and Medicine, Third Edition, Elsevier-Academic Press, 2008.
- M.O. Ortín, Física para Biología, Medicina, Veterinaria y Farmaci. Ed. Crítica (1996)
- B. Rubin. Compendium of Biophysics. Wiley, 2017. Online access: <https://onlinelibrary.wiley.com/doi/book/10.1002/9781119160281>
- T. Bécherrawy. Vibrations and Waves. Wiley, 2011. Online access: <https://onlinelibrary.wiley.com/doi/book/10.1002/9781118586525>
- D. and H. Yevik. Fundamental Math and Physics for Scientists and Engineers. Wiley, 2014. Online access: <https://onlinelibrary.wiley.com/doi/book/10.1002/9781118979792>

Software

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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	111	Catalan	second semester	morning-mixed

(PAUL) Classroom practices	112	Catalan	second semester	morning-mixed
(TE) Theory	11	Catalan	second semester	morning-mixed