UAB
Universitat Autònoma de Barcelona

Physics and Contemporary Thought

Code: 106232
ECTS Credits: 6

2025/2026

Degree	Type	Year
Science, Technology and Humanities	OB	3

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 none.

Objectives and Contextualisation

The main objective of the course is to understand the relationship between physics and other areas of contemporary humanistic thought, especially philosophy. To this end, we will analyse:
1) The foundations and implications of humanistic reasoning about physics.
2) The relevance of physical concepts and experiences for philosophical reasoning.
3) The limits and redefinition of the shifting boundaries between physics and humanistic thought.

Competences

- Describe the fundamental forces of nature in relation to the configuration of the universe and the structure of matter.
- Make critical use of digital tools and interpret specific documentary sources.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Work collaboratively in teams.

Learning Outcomes

1. Assess the reliability of sources, select important data and cross-check information.
2. Develop teamworking skills, blend in and actively collaborate in achieving common goals.
3. Present and interpret results from searches in bibliography and other important sources.
4. Recognise the fundamental concepts of special relativity and quantum mechanics and the historical context in which they appeared.

Content

1. Classical conceptions of space and time
2. Space-time in relativity
3. Classical conceptions of matter
4. The equivalence of mass and energy
5. Classical conceptions of gravity
6. Gravitation in general relativity
7. Matter and energy in quantum theory
8. Indeterminism and measurement: Quantum Dialogues between Physics and Philosophy
9. Models and reality

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lectures	33	1.32	4
Practical-theoretical lectures	16	0.64	2, 3, 4, 1
Type: Autonomous			
Personal work	99	3.96	2, 3, 4, 1

The presentations of the topics are complemented by the texts available in the Moodle Classroom. The folder of each topic contains the texts that we will discuss in the classroom practices, and additional texts or materials. In the descriptor of each topic we propose questions to guide the reading and analysis of the texts.

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
Essays	40 %	0	0	2, 3, 4, 1

Exam	30 %	2	0.08	4
Review	30 %	0	0	2, 3, 4, 1

Essays
You have to submit through the Moodle Classroom, either individually or in groups of two, 5 short texts (maximum 600 words) within the indicated deadlines. You will discuss some of the questions we raise for each block, in relation to the proposed readings. We will grade the submissions through the Moodle Classroom.

Exam blocks 1 to 3
The exam will be based on the questions proposed in the Virtual Campus and will refer to the texts we will have analysed. You will have to identify and explain the significance of some of these texts. The exam is scheduled for week 8 of the semester.

Drawing up of a documentary record
The assessment of the 2nd part of the subject consists of the selection of a source relevant to the relationship between physics and contemporary thought and the elaboration of a document with a predetermined structure. The source can be of different types: archival source (letter, photograph, manuscript, memoi…r); printed source; object or instrument; audiovisual source. You can prepare the document individually or in groups of two. The source will be presented in the classroom.

Recovery
There will be a recovery test of the course, with a maximum total weight of 60%. In order to participate, you must have been evaluated in a set of activities the weight of which is equivalent to a minimum of two thirds of the total grade of the subject.
The student will be considered as non-assessable if he/she has not participated in all the assessment activities.

Single assessment
If you opt for the Single Assessment, you will have to submit the hand-outs and the review on the same day you take the exam corresponding to themes 1 to 4. The weighting of these elements will be the same as that of the Continuous Assessment.

In the event of a student committing any irregularity that may lead to a significant variation in the grade awarded to an assessmentactivity,the student will be given a zero for this activity, regardless of any disciplinary process that may take place. In the event of several irregularities in assessment activities of the same subject, the student will be given a zero as the final grade for this subject.

This subject allows the use of AI technologies as an integral part of the submitted work, provided that the final result reflects a significant contribution from the student in terms of analysis and personal reflection. The student must clearly (i) identify which parts have been generated using AI technology; (ii) specify the tools used; and (iii) include a critical reflection on how these have influenced the process and final outcome of the activity. Lack of transparency regarding the use of AI in the assessed activity will be considered academic dishonesty; the corresponding grade may be lowered, or the work may even be awarded a zero.
In cases of greater infringement, more serious action may be taken.

Bibliography

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Canales, Jimena. *The physicist and the philosopher. Einstein, Bergson, and the debate that changed our understanding of time*. Princeton and Oxford: Princeton University Press, 2015. Hi ha trad. cast. d'Àlex Guàrdia: *El físico y el filósofo. Albert Einstein, Henri Bergson y el debate que cambió nuestra comprensión del tiempo* (Barcelona: Arpa, 2020).
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Huggett, Nick (1997). *Space from Zeno to Einstein. Classic readings with a Contemporary Commentary*. Cambridge, MA: The MIT Press.
Kern, Stephen (1983). *The Culture of Time and Space, 1880-1918*. Cambridge, MA: Harvard University Press.
Kojevnikov, Alexei (2020). The Copenhagen network: the birth of quantum mechanics from a postdoctoral perspective. Cham: Springer. Ch. 6: Philosophical Wrangling.
Price, Huw (1997). Time's Arrow and Archimedes' Point: New Directions for the Physics of Time. New York: Oxford University Press.
Schneider, Susan, ed. (2016). Science Fiction and Philosophy: From Time Travel to Superintelligence. Hoboken: Wiley. Part V: Space and Time.
Zalta, Edward N.; Nodelman, Uri, eds. The Stanford Encyclopedia of Philosophy. Stanford: The Metaphysics Research Lab, Stanford University.

Software

No specific software is required.

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	1	Catalan	first semester	morning-mixed
(TE) Theory	1	Catalan	first semester	morning-mixed