

## 63242 - Disciplinary Content of Physics

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 63242 - Disciplinary Content of Physics

**Faculty / School:** 107 - Facultad de Educación

**Degree:** 584 - Master's Degree in Teaching Compulsory Secondary Education

590 - University Master's Degree in Teaching, specializing in Geography and History

591 - Master's Degree in Teaching, specializing in Philosophy

592 - Master's Degree in Teaching, specializing in Business and Economics

593 - Master's Degree in Teaching, specializing in Mathematics

594 - Master's Degree in Teaching, specializing in Technology and Computer Science

595 - Master's Degree in Teaching, specializing in Biology and Geology

596 - Master's Degree in Teaching, specialization in Physics and Chemistry

597 - Master's Degree in Teaching, specializing in Spanish Language and Literature. Latin and Greek

598 - Master's Degree in Teaching, specialization in Foreign Language: French

599 - Master's Degree in Foreign Language Teaching: English

600 - University Master's Degree in Teaching, specializing in Music and Dance

601 - University Master's Degree in Teaching, specializing in Industrial and Construction Processes

602 - University Master's Degree in Teaching, specializing in Administration, Marketing, Tourism, Services to the Community and FOL

603 - Master's Degree in Teaching, specializing in Sanitary, Chemical, Environmental and Health Processes Agri-food

**ECTS:** 6.0

**Year:** 1

**Semester:** Second semester

**Subject type:** Optional

**Module:**

### 1. General information

This subject is an essential element in the preparation of teachers with degrees other than Physics or for their professional practice as teachers of Physics in the field of Secondary Education. It tries to complete the knowledge of the students so that they obtain the basic competences in the handling of the concepts and procedures of Physics from a global perspective in its social, cultural and technological context, based on the historical development of the fundamental concepts and theories of Physics.

These approaches and objectives are aligned with Sustainable Development Goals (SDGs) 4, 5, 8 and 10 of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>) in such a way that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement.

### 2. Learning results

1. It states, synthesizes, analyses, relates and applies, based on the historical development of fundamental concepts and theories, the basic principles and fundamentals of Physics: Mechanics, Fluids, Waves, Electricity and Magnetism, Optics and Modern Physics.
2. Solves physical problems by applying models and interprets quantitatively and qualitatively the results obtained.
3. Expresses adequately in substance and form, using scientific notation, units and orders of magnitude, the methods, the results obtained and their analysis in the cases proposed for study.
4. Perform experiments with proper treatment of experimental data.

### 3. Syllabus

The program consists of the Physics concepts taught in Secondary Education and High School: 1: Scientific activity

2: Kinematics

3: Dynamics

4: Gravitational interaction

5: Electromagnetic interaction

6: Waves

7: Geometric optics

8: 20th Century Physics

## 4. Academic activities

1. Face-to-face activities (60 hours) consisting of the following activities:

- Exhibitions and demonstrations of physical phenomena directly related to each didactic unit.
- Group discussion and analysis of the phenomena and their application.
- Convincing presentations and demonstrations by the students of the directed work done by each student.

Depending on the needs and interests detected in the students, experimental sessions in the laboratory or visits may also be included within the class schedule

2. Non-attendance activities (40 hours) that will consist of the following activities:

- Elaboration of the corresponding learning portfolio that includes the resolution of the proposed problems.

## 5. Assessment system

The student must demonstrate achievement of the intended learning results through the following assessment activities:

1. Global written test.

The overall written test will be made up of questions requiring short answers (limited-response tests or multiple choice type). In any case, the questions will be related to essential aspects of the subject matter covered in the subject.

2. Participation in practical classes.

Class attendance. Participation in the face-to-face sessions of the subject, through interventions in debates and presentations of the results of the proposed activities.

Students who regularly attend the learning activities proposed by the teacher may obtain additional points for solving and defending on the blackboard any of the proposed activities. Participation in this activity is voluntary. Each additional point will add 0.1 points to the final grade.

3. Directed work.

Elaboration of an individual portfolio reflecting the different activities proposed by the teacher in the classroom throughout the classes

Quality in the execution of individual portfolio assignments will be evaluated by the following criteria: \* Clear organization and presentation

\* Correct writing and appropriate use of the language of Physics in the field of Secondary Education.

\* Sufficient extension in the development of each task, so that the topics covered constitute self-sufficient elements for reading and comprehension

\* Originality

\* Diagrams, links, illustrations, etc. to support the understanding of the topics presented.

Fraud or total or partial plagiarism in any of the evaluation tests will result in not passing the subject with the minimum grade, in addition to the disciplinary sanctions adopted by the Guarantee Committee for these cases.

Grading.

a) Continuous evaluation.

In this case, attendance to at least 85% of the sessions is required.

The final grade for the subject will be obtained with the best of the grades given by the following formulas: Final grade =  $0,2*CA+0,6*CP+0,2*CPE+0,1*PA$

or,

Final grade = CPE

where

CA = hours attended/school hours

CP = Average portfolio rating

CPE = Final written test grade

PA = Additional points

The maximum grade that can be obtained is 10. In the event that the above formula results in a grade greater than 10, the excess grade will be taken into account for the order of assignment of Honours.

b) Global evaluation through the final written test, second and subsequent ordinary and extraordinary calls.

For students who do not opt for the continuous evaluation system, the final grade of the subject will be obtained with the best grade given by the following formulas :

Final grade =  $0.5*CP + 0.5*CPE$

or,

Final grade = CPE

where

CP = Average portfolio rating

CPE = Final written test grade

Finally, it must be taken into account that the Regulations of the Rules of Coexistence of the University of Zaragoza will be applicable to irregularities committed in the evaluation tests through academic fraud, as well as the application of article 30 of the Regulations of the Rules of Evaluation of Learning in relation to irregular practices other than academic fraud.