

## SUBJECT TEACHING GUIDE

### G1956 - Physics

#### Degree in Civil Engineering First Degree in Civil Engineering

Academic year 2022-2023

| 1. IDENTIFYING DATA              |  |                  |                    |                  |                              |
|----------------------------------|--|------------------|--------------------|------------------|------------------------------|
| Degree                           | Degree in Civil Engineering<br>First Degree in Civil Engineering |                  |                    | Type and Year    | Core. Year 1<br>Core. Year 1 |
| Faculty                          | School of civil Engineering                                      |                  |                    |                  |                              |
| Discipline                       | PHYSICS FOR CIVIL ENGINEERING                                    |                  |                    |                  |                              |
| Course unit title and code       | G1956 - Physics  |                  |                    |                  |                              |
| Number of ECTS credits allocated | 6  | Term             | Semester based (1) |                  |                              |
| Web                              | <a href="https://moodle.unican.es">https://moodle.unican.es</a>  |                  |                    |                  |                              |
| Language of instruction          | Spanish  | English Friendly | No                 | Mode of delivery | Face-to-face                 |

|                  |   |  |  |  |  |
|------------------|---|--|--|--|--|
| Department       | DPTO. CIENCIA E INGENIERIA DEL TERRENO Y DE LOS MATERIALES                                  |  |  |  |  |
| Name of lecturer | PEDRO SERRANO BRAVO   |  |  |  |  |
| E-mail           | pedro.serrano@unican.es   |  |  |  |  |
| Office           | E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 1. DESPACHO PROFESORES (1055) |  |  |  |  |
| Other lecturers  | DIEGO FERREÑO BLANCO  |  |  |  |  |

| 3.1 LEARNING OUTCOMES   |
|---|
| -- To understand the mechanics of material points and solving advanced problems.  |
| -- To solve problems of fluid statics, centers and buoyancy forces.   |
| -- To understand and solve problems of Thermometry, Calorimetry and energy exchanges.   |
| -- To calculate electric and magnetic fields created by different charge distributions and to understand and solve their practical effects. |

#### 4. OBJECTIVES

- To understand the fundamental laws of Newtonian Mechanics.
- To know the static and dynamic behavior of ideal fluids as well as their most important applications.
- To understand and apply the fundamental principles of Thermodynamics to practical cases.
- To understand and apply the basic principles of Electromagnetic Theory
- To develop basic experimental analyses of the previous subjects.

#### 6. COURSE ORGANIZATION

| CONTENTS |   |
|----------|---|
| 1        | Vector Calculus. Scalars and vectors.   |
| 2        | Material point kinematics and dynamics. Energetic approach to dynamics.   |
| 3        | Fluid mechanics. Ideal fluid statics. Ideal fluid dynamics.   |
| 4        | Thermodynamics. Thermal properties of matter. State equations. First Law of thermodynamics. Second principle of thermodynamics  |
| 5        | Electromagnetic Theory. Electrostatic field and potential. Study of balanced conductors. Study of dielectric media. Stationary electrical currents. Static magnetic field |

#### 7. ASSESSMENT METHODS AND CRITERIA

| Description   | Type                  | Final Eval. | Reassessn | %             |
|---|-----------------------|-------------|-----------|---------------|
| Midterm Exam 1 in October   | Written exam          | No          | Yes       | 35,00         |
| Midterm Exam 2 in December  | Written exam          | No          | Yes       | 35,00         |
| Practical exam in the laboratory  | Laboratory evaluation | No          | No        | 20,00         |
| The student's participation in the development of the course, carrying out problems proposed during the course and any other activity indicated by the teacher will be evaluated. | Others                | No          | No        | 10,00         |
| <b>TOTAL</b>  |                       |             |           | <b>100,00</b> |

#### Observations

The final exams of January or February will consist of the recovery of the midterm evaluations, exclusively in the event that they have been failed.

The practical exam will be considered during the performance of the practice, plus the practical exam, which will consist of the realization by the student of a practical carried out in the course.

Only under duly justified reasons (e.g. health issues) the assessment tests may be arranged remotely, with prior authorization from the Centre's Management.

#### Observations for part-time students

**8. BIBLIOGRAPHY AND TEACHING MATERIALS**

## BASIC

- Sears F.W., Zemansky M.W., Young H.D., Física Universitaria, Addison Wesley, 1988.
- Tipler P.A., Física (2 Volúmenes), Reverté, 1988.
- Serway R. A., Jewet J. W. Física para Ciencias e Ingeniería. Cengage Learning.
- Giancoli D. C., Física para Ciencias e Ingeniería. Ed. Pearson Educación.
- García Calderón, M.A., Cuadernos de Física I. Ediciones TGD. Edificio Interfacultativo. Universidad de Cantabria, 2003.
- García Calderón, M.A., Cuadernos de Física II. Ediciones TGD. Edificio Interfacultativo. Universidad de Cantabria, 2003.

La documentación para usar en las clases teóricas y prácticas se publicará en el Campus Virtual , plataforma Moodle.