



## Teaching Guide

| Teaching Guide      |                                                 |        |                                          |           |
|---------------------|-------------------------------------------------|--------|------------------------------------------|-----------|
| Identifying Data    |                                                 |        |                                          | 2022/23   |
| Subject (*)         | FÍSICA I                                        |        | Code                                     | 730G04003 |
| Study programme     | Grao en Enxeñaría en Tecnoloxías Industriais    |        |                                          |           |
| Descriptors         |                                                 |        |                                          |           |
| Cycle               | Period                                          | Year   | Type                                     | Credits   |
| Graduate            | 1st four-month period                           | First  | Basic training                           | 6         |
| Language            | Spanish                                         |        |                                          |           |
| Teaching method     | Face-to-face                                    |        |                                          |           |
| Prerequisites       |                                                 |        |                                          |           |
| Department          | Enxeñaría Naval e Industrial                    |        |                                          |           |
| Coordinador         | Mateo Orenes, Maripaz                           | E-mail | paz.mateo@udc.es                         |           |
| Lecturers           | Mateo Orenes, Maripaz<br>Nicolas Costa, Gines   | E-mail | paz.mateo@udc.es<br>gines.nicolas@udc.es |           |
| Web                 |                                                 |        |                                          |           |
| General description | Descrición dunha das partes da Física: Mecánica |        |                                          |           |

## Study programme competences

| Code | Study programme competences                                                                                                                                                                                                                                                                                                                              |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A2   | FB2 Comprensión e dominio dos conceptos básicos sobre as leis xerais da mecánica, termodinámica, campos e ondas e electromagnetismo e a súa aplicación para a resolución de problemas propios da enxeñaría.                                                                                                                                              |
| B1   | CB1 Que os estudantes demostren posuír e comprender coñecementos nunha área de estudo que parte da base da educación secundaria xeral e adoita encontrarse a un nivel que, aínda que se apoia en libros de texto avanzados, inclúe tamén algúns aspectos que implican coñecementos procedentes da vangarda do seu campo de estudo                        |
| B2   | CB2 Que os estudantes saiban aplicar os seus coñecementos ao seu traballo ou vocación dunha forma profesional e posúan as competencias que adoitan demostrarse por medio da elaboración e defensa de argumentos e a resolución de problemas dentro da súa área de estudo                                                                                 |
| B3   | CB3 Que os estudantes teñan a capacidade de reunir e interpretar datos relevantes (normalmente dentro da súa área de estudo) para emitiren xuízos que inclúan unha reflexión sobre temas relevantes de índole social, científica ou ética                                                                                                                |
| B6   | B3 Ser capaz de concibir, deseñar ou poñer en práctica e adoptar un proceso substancial de investigación con rigor científico para resolver calquera problema formulado, así como de comunicar as súas conclusións ?e os coñecementos e razóns últimas que as sustentan? a un público tanto especializados como leigo dun xeito claro e sen ambigüidades |
| B7   | B5 Ser capaz de realizar unha análise crítica, avaliación e síntese de ideas novas e complexas                                                                                                                                                                                                                                                           |
| B8   | B7 Deseñar e realizar investigacións en ámbitos novos ou pouco coñecidos, con aplicación de técnicas de investigación (con metodoloxías tanto cuantitativas como cualitativas) en distintos contextos (ámbito público ou privado, con equipos homoxéneos ou multidisciplinares etc.) para identificar problemas e necesidades                            |
| B9   | B8 Adquirir unha formación metodolóxica que garanta o desenvolvemento de proxectos de investigación (de carácter cuantitativo e/ou cualitativo) cunha finalidade estratéxica e que contribúan a situarnos na vangarda do coñecemento                                                                                                                     |
| C1   | C3 Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.                                                                                                                                                                       |
| C5   | C7 Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.                                                                                                                                                                                                                                                                      |

## Learning outcomes

| Learning outcomes | Study programme competences |
|-------------------|-----------------------------|
|                   |                             |



|                                                                                                                                       |    |                                        |          |
|---------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------------|----------|
| Knowledge of the basic concepts about the general laws of mechanics and their application for the resolution of engineering problems. | A2 | B1<br>B2<br>B3<br>B6<br>B7<br>B8<br>B9 | C1<br>C5 |
|---------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------------|----------|

| Contents                                                                                            |                                                                                                |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Topic                                                                                               | Sub-topic                                                                                      |
| The following chapters and lessons develop the contents established in the Verification Report card | Kinematics<br>Statics<br>Dynamics                                                              |
| Chapter I INTRODUCTION                                                                              | Lesson 1 Introduction to Physics<br>Lesson 2 Physical magnitudes<br>Lesson 3 Vector magnitudes |
| Chapter II STATICS OF THE PARTICLE, THE PARTICLE SYSTEM AND THE RIGID SOLID                         | Lesson 4 Statics                                                                               |
| Chapter III KINEMATICS                                                                              | Lesson 5 Point kinematics<br>Lesson 6 Relative movement<br>Lesson 7 Kinematics of the solid    |
| Chapter IV DYNAMICS OF THE PARTICLE                                                                 | Lesson 8 Dynamics of the particle<br>Lesson 9 Work and energy                                  |
| Chapter V DYNAMICS OF THE PARTICLE SYSTEM AND THE RIGID SOLID                                       | Lesson 10 Dynamics of particle systems<br>Lesson 11 Dynamics of the rigid solid                |

| Planning                                                                                                                        |                            |                      |                               |             |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests                                                                                                           | Competencies               | Ordinary class hours | Student's personal work hours | Total hours |
| Guest lecture / keynote speech                                                                                                  | A2 B1 B7 C5                | 30                   | 33                            | 63          |
| Problem solving                                                                                                                 | A2 B1 B2 B3 B6 B7<br>B8 B9 | 20                   | 36                            | 56          |
| Laboratory practice                                                                                                             | A2 B1 B2 B3 B7 C1          | 10                   | 15                            | 25          |
| Mixed objective/subjective test                                                                                                 | A2 B2                      | 0                    | 4                             | 4           |
| Personalized attention                                                                                                          |                            | 2                    | 0                             | 2           |
| (*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. |                            |                      |                               |             |

| Methodologies                   |                                                                                                                                                                                                                                                                              |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Methodologies                   | Description                                                                                                                                                                                                                                                                  |
| Guest lecture / keynote speech  | Oral presentation complemented with the use of audiovisual media and the introduction of some questions addressed to students, in order to transmit knowledge and facilitate learning. Theory classes on the blackboard. Recommended assistance                              |
| Problem solving                 | Technique by means of which a specific problematic situation must be solved, based on the knowledge that has been worked on, which can have more than one possible solution. Resolution by the teacher and by the students of the proposed exercises. Recommended assistance |
| Laboratory practice             | Methodology that allows students to learn effectively through the realization of practical activities, such as demonstrations, exercises, experiments and research. Mandatory attendance                                                                                     |
| Mixed objective/subjective test | Test that integrates questions about the theoretical and practical contents of the subject                                                                                                                                                                                   |



## Personalized attention

| Methodologies       | Description                                                                                                                                                                                                                                                                                                                 |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Laboratory practice | Discussion about the different aspects of the subject: theory, problems, practices.<br>Students with recognition of part-time dedication DO NOT have an academic exemption from attendance exemption for Laboratory Practices, although they will be given facilities regarding the dates of completion prior communication |

## Assessment

| Methodologies                   | Competencies      | Description                                                                                    | Qualification |
|---------------------------------|-------------------|------------------------------------------------------------------------------------------------|---------------|
| Mixed objective/subjective test | A2 B2             | It consists of a partial non-eliminary test in the middle of the quadrimester and a final test | 90            |
| Laboratory practice             | A2 B1 B2 B3 B7 C1 | Mandatory: Unjustified faults are not allowed                                                  | 10            |

## Assessment comments

There will be a partial non-eliminary test throughout the quadrimester for the continuous evaluation and a final test coinciding with the date of the exam approved in the Center Meeting.

The final test will consist of a part of theory and a part of problems of the whole of the subject.

The attendance and the realization of the laboratory practices are mandatory. Its qualification weight is set in the table.

The final grade will be calculated according to the following formula:

$$0.1 * PR + 0.9 * (0.4 * T + 0.6 * PB) + 0.1 * PA$$

Being PR: Note of practices; T: Note of theory of the final exam; PB: Note of problems of the final exam; PA: Note of the Partial exam. All notes calculated on 10

The evaluation criteria in the 2nd opportunity are the same as those in the 1st opportunity.

Students with recognition of part-time dedication DO NOT have an academic exemption of attendance exemption for Laboratory Practices, although they will be given facilities regarding the dates of completion prior communication. The criteria and evaluation activities for this student will be the same as for the rest of the students and are indicated in the table.

## Sources of information

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>         | <ul style="list-style-type: none"> <li>- Bedford A., Fowler W. (1996). Mecánica para ingeniería: Estática. Addison-Wesley iberoamericana</li> <li>- Bedford A., Fowler W. (1996). Mecánica para ingeniería: Dinámica. Addison-Wesley iberoamericana</li> <li>- Tipler P.A. (2004). Física para la ciencia y la tecnología. Reverté</li> <li>- Serway R.A., Jewett J.W. (2008). Física: para ciencias e ingenierías. Cengage Learning</li> <li>- Alonso M., Finn E. (1986-1995). Física. Addison-Wesley</li> <li>- Beer F.P., Johnston E.R., Eisenberg E.R. (2007). Mecánica Vectorial para ingenieros. McGraw-Hill</li> <li>- Sears, Zemansky, Young (1986-1998). Física Universitaria. Addison-Wesley</li> <li>- Giancoli D.C. (1997). Física. Prentice Hall</li> <li>- Scala J.J. (1995). Análisis vectorial. Reverté</li> </ul> |
| <b>Complementary</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

CÁLCULO/730G04001



## Subjects that continue the syllabus

Physics II/730G03009

### Other comments

To help achieve a sustained immediate environment and meet the goal of action number 5: "Healthy and environmental and social teaching and research" of the "Green Campus Ferrol Action Plan", the following recommendations are made:

-Make a sustainable use of resources and the prevention of negative impacts on the natural environment

-The delivery of the documentary works that are made in this matter:

? It will be done through Moodle, in digital format without the need to print them

? If it is necessary to make them on paper:

- Plastics will not be used
- Double-sided prints will be made.
- Recycled paper will be used.
- The printing of drafts will be avoided

(\*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.