

## SUBJECT TEACHING GUIDE

G1776 - Astronomy

Double Degree in Physics and Mathematics  
Degree in Physics

Academic year 2022-2023

| 1. IDENTIFYING DATA              |   |                  |   |
|----------------------------------|---|------------------|---|
| Degree                           | Double Degree in Physics and Mathematics<br>Degree in Physics     |                  | Type and Year<br>Compulsory. Year 4<br>Compulsory. Year 3 |
| Faculty                          | Faculty of Sciences   |                  |   |
| Discipline                       | Subject Area: Classical Mechanics and Astronomy<br>Central Module |                  |   |
| Course unit title and code       | G1776 - Astronomy   |                  |   |
| Number of ECTS credits allocated | 6   | Term             | Semester based (2)  |
| Web                              |   |                  |   |
| Language of instruction          | English   | Mode of delivery | Face-to-face  |

|                  |  |
|------------------|--|
| Department       | DPTO. FISICA MODERNA   |
| Name of lecturer | FRANCISCO JESUS CARRERA TROYANO  |
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| Office           | IFCA - Edificio Juan Jordá. Planta: + 1. DESPACHO (107)                          |
| Other lecturers  | AMALIA CORRAL RAMOS<br>ROSA MARIA DOMINGUEZ QUINTERO<br>LORENZO BARQUIN GONZALEZ |

### 3.1 LEARNING OUTCOMES

- Acquire an overall view of the Universe: scale of the various structures, position of the Earth
- Know the role of the different forces acting on the Universe and their range of application
- Understand the life cycle of the stars
- Understand Astrophysical phenomena
- Understand the role of General Relativity in studying the Universe
- Know the evidence for the Big Bang
- Understand the complementarity of observations performed with different detectors at different wavelengths
- Analyse new phenomena through indirect evidence

### 4. OBJECTIVES

- Application of their previous knowledge of Physics on an astronomical context
- Realisation of the main physical processes happening in astronomical objects
- Application of simple physical approximations to understand the basic behaviour of those objects
- Experience in the process of gathering astronomical data
- Analysis of real and simulated astronomical data, to extract physical information from them
- Critical evaluation of the correctness of the results of the calculations performed, through the analysis of orders of magnitude and the development of physical intuition
- Obtaining information on astronomical topics: analysing and summarising it critically
- Present publicly and discuss the results of a task

### 6. COURSE ORGANIZATION

#### CONTENTS

|   |  |
|---|--|
| 1 | Introduction: main concepts and history      |
| 2 | Physical processes in Astronomy              |
| 3 | Positional Astronomy                         |
| 4 | Observables and instrumentation in Astronomy |
| 5 | The Solar System and the Sun                 |
| 6 | Exoplanets                                   |
| 7 | Stars  |
| 8 | Galaxies and Active Galaxies                 |
| 9 | Large Scale Structure and Cosmology          |

## 7. ASSESSMENT METHODS AND CRITERIA

| Description   | Type                  | Final Eval. | Reassessn | %             |
|---|-----------------------|-------------|-----------|---------------|
| Development, results and written report of each lab./observational session  | Laboratory evaluation | No          | Yes       | 40,00         |
| Partial exams   | Written exam          | No          | Yes       | 30,00         |
| Final exam  | Written exam          | Yes         | Yes       | 30,00         |
| <b>TOTAL</b>  |                       |             |           | <b>100,00</b> |
| <b>Observations</b>   |                       |             |           |               |
| <p>The written reports will be checked for plagiarism, following the University rules for such cases if it is found, as will the use of illicit means in the partial and final exams.</p> <p>All hand-ins during the course will be done via Moodle, no other means will be accepted.</p>   |                       |             |           |               |
| <b>Observations for part-time students</b>  |                       |             |           |               |
| <p>The final exam is compulsory for part time students.</p> <p>The partial exams may be discounted and the final exam contributing 60% of the score if requested by the student in advance of the date of the final exam.</p> <p>The schedule and timetables of the laboratory sessions will be as flexible as possible, as well as the deadlines for the presentations of the written reports.</p> |                       |             |           |               |

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

### BASIC

"Fundamental Astronomy" H. Karttunen, P. Kröger, H. Oja, 2007, Springer