



Bachelor in Physics (Academic Year 2021-22)

Astrophysics		Code	800507	year	3rd	Sem.	1º
Module	Fundamental Physics	Topic	General Astrophysics	character	Optional		

	Total	Theory	Exercises
ECTS credits:	6	4	2
Semester hours	43	28.5	14.5

Learning Objectives (according to the Degree's Verification Document)
<ul style="list-style-type: none"> • Know the basic techniques of astronomical observation. • Be able to interpret the basic observational parameters. • Understand the different scales and structures in the Universe • Know the main physical properties of stars, galaxies, the interstellar medium, star clusters and galaxies, etc. • Be able to understand the foundations of the standard cosmological model and the observational evidence that supports it.
Brief description of contents
Introduction to Astrophysics (history, astronomical observation), planets (of the Solar System, extrasolar), stars (the Sun, stellar parameters, stellar evolution), galaxies (the Milky Way, external galaxies), the Universe (structure, cosmology).
Prerequisites
Knowledge of General Physics.

Coordinator:	Jesús Gallego Maestro			Department:	FTA
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Lecturers and Seminars – Lecturers and Schedule						
Group	Classroom	Day	Schedule	Lecturer	hours	Department
B	6	Mon, Fri	13:30–15:00	Patricia Sánchez-Blázquez,	43	FTA

Office hours				
Group	Professor	Schedule	e-mail	Location
B	Patricia Sánchez-Blázquez	Mon & Wed: 16:00-17:30 +3h on line	psanchezblazquez@ucm.es	office10, ground floor, West wing

* 3 h tutorials during the working week through email, virtual campus, etc.

SYLLABUS
<p>I. Introduction</p> <ol style="list-style-type: none"> 1. History of Astronomy 2. Astronomical Observation <p>II. Stars</p> <ol style="list-style-type: none"> 3. The Sun 4. The solar system 5. Stellar parameters 6. Star Formation 7. Exoplanets 8. Stellar Evolution 9. The death of stars <p>III. Galaxies</p> <ol style="list-style-type: none"> 10. The Milky Way 11. The Nature of Galaxies 12. Dynamics and Evolution of Galaxies. 13. Active Galaxies <p>IV. The Universe</p> <ol style="list-style-type: none"> 14. The Structure of the Universe 15. Cosmology <p>Appendix: Celestial Sphere</p>

Bibliography
<ul style="list-style-type: none"> • "<i>Universe</i>", by R. A. Freedman, R.M. Geller y W.J. Kauffmann III, Ed. W.H. Freeman & Co., 2013. • "An Introduction to modern astrophysics", by B. W. Carroll y D. A. Ostlie, Ed. Addison-Wesley, 2007. • "Fundamental Astronomy", by H. Karttunen et al., Ed. Springer, 2007.
Online Resources
<p>Online resources will be provided through the virtual campus.</p>

Methodology
on-campus teaching 100% (Scenario 0)
<p>Theory lectures, using a power-point presentation, will be delivered on campus.</p>
semi-online teaching (Scenario 1)
<p>Lectures will be delivered on-campus, but the presence on the classroom will be limited to a reduced number of students that will change every week. The rest of students will be able to follow the lectures online, using tools as Google Meet, or Teams, etc. Lectures may be recorded for later incorporation in the virtual campus, subjected to the rules and procedures that the UCM dictates at the time.</p>
online teaching (Scenario 2)
<p>Online lectures during the days and times scheduled in the calendar for the subject. Video recordings and support material will be provided and made available on the virtual campus so that students can consult them during the course. Additional sessions will be scheduled, using tools such as Microsoft Teams or Google Meet, to address students' questions and promote teacher-student interaction. All lectures will be recorded so that they are available to students on the virtual campus, as long as the connectivity conditions allow it and according to the procedures arbitrated by the UCM.</p>

Evaluation criteria		
Exams	Weight:	70%
There will be a final exam, consisting of brief questions and exercises that may include some questions from the online tests (see other assessment activities).		
Other activities	Weight:	30%
Online tests and exercises available to the students on the virtual campus.		
Final mark		
The final mark will be calculated as: $N_{Final} = 0.7N_{Exam} + 0.3N_{OtherActiv}$, where N_{Exam} and $N_{OtherActiv}$ represent the grades (from 0 to 10) obtained in the Exam and Other Activities respectively.		