Bachelor in Physics
(Academic Year 2024-25)

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	45	30	15

Learning Objectives (according to the Degree's Verification Document)

- 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	Javier Gorgas García		**Department:**	FTA
	Office:	00.310.0	**e-mail**	jgorgas@ucm.es

Theory/Problems – Schedule and Teaching Staff

Group	**Lecture Room**	**Day**	**Time**	**Professor**	**Period/ Dates**	**Hours**	**T/E**	**Dept.**
B	7	Mo, F	13:30 – 15:00	O'Sullivan, Shane Patrick	Full term	45	T/P	FTA

Office hours				
Group	**Professor**	**Schedule**	**E-mail**	**Location**
B	O'Sullivan, Shane Patrick		shanepos@ucm.es	04. 211.0

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

SYLLABUS

I. Introduction
1. History of Astronomy
2. Astronomical Observations

II. Planets
3. Introduction to the Solar System
4. Planetary Physics
5. Exoplanets

III. Stars
6. Stellar Parameters
7. Star Formation
8. The Sun
9. Stellar Evolution
10. Stellar Death

IV. Galaxies
11. The Milky Way
12. The Nature of Galaxies
13. Dynamics and Evolution of Galaxies
14. Active Galaxies

V. The Universe
15. The Structure of the Universe
16. Cosmology

Bibliography

- "*Universe*", 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

Online resources will be provided through the virtual campus.

Methodology

Teaching is delivered through lectures focusing on the theoretical aspects of the field, and resolution of quantitative exercises.

Evaluation criteria

Exams	Weight:	70%

A written exam with theoretical questions and quantitative exercises about the material covered in the

course.		
Other activities	**Weight:**	30%
Resolution of questionnaires and exercises through the virtual campus and/or in-class exercises.		
Final mark		
The course grade, NFinal, will be determined according to the following plan: • NFinal = 0.7·NE + 0.3·NOA if $4 \leq NE \leq NFinal$ • NFinal = NE if the above condition does not apply The same NOA will be used in all the calls of the academic year.		