Universitat Autònoma de Barcelona

# Galaxies and Extragalactic Astrophysics 2016/2017

Code: 42861
ECTS Credits: 9

| Degree | Type | Year | Semester |
|---|---|---|---|
| 4313861 High Energy Physics, Astrophysics and Cosmology | OT | 0 | 2 |

## Contact

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## Use of languages

Principal working language: english (eng)

## External teachers

Jorge Carretero

Linda Blot

## Prerequisites

None.

## Objectives and Contextualisation

The course is intended to acquaint students with the basic concepts
about galaxies and extragalactic astronomy research in general.
We want to present the students how we have been learning about the galaxy
properties throughout the years to reach our current understanding of
galaxy formation and evolution and what the current lines of research are nowadays.

## Skills

- Formulate and tackle problems, both open and more defined, identifying the most relevant principles and using approaches where necessary to reach a solution, which should be presented with an explanation of the suppositions and approaches.
- Understand the bases of advanced topics selected at the frontier of high energy physics, astrophysics and cosmology and apply them consistently.

## Learning outcomes

1. Distinguish between the different types of active galaxy.
2. Tackle the problem of the evolution of galaxies in its totality.
3. Understand the fundamentals and evolution of the Milky Way.

## Content

- Historical introduction
- Galaxy Classification
- Galaxy Dynamics

- Global Properties of Galaxies
- The Milky Way
- The Local Group
- Stellar Population Synthesis Models
- Photometric Redshifts
- Gravitational Lenses
- Clusters of Galaxies
- Active Galaxies and Quasars
- High Redshift Galaxies
- Galaxy Models

## Methodology

Lectures and exercises.

Classwork and homework.

## Activities

| Title | Hours | ECTS | Learning outcomes |
|---|---|---|---|
| **Type: Directed** | | | |
| Lectures | 68 | 2.72 | |
| **Type: Autonomous** | | | |
| Exercises, presentations, discussion, literature work | 68 | 2.72 | |
| Study of lectures material | 68 | 2.72 | |

## Evaluation

Exam, homework, oral presentation and summary of seminar material.

## Evaluation activities

| Title | Weighting | Hours | ECTS | Learning outcomes |
|---|---|---|---|---|
| Exam | 50% | 2 | 0.08 | 1, 2, 3 |
| Homework exercises | 20% | 9 | 0.36 | 1, 2, 3 |
| Oral presentation | 20% | 7 | 0.28 | 1, 2, 3 |
| Summary of seminar material | 10% | 3 | 0.12 | 1, 2, 3 |

## Bibliography

"Galactic Astronomy", Binney and Merrifield, PrincetonUniversity Press, 1998

"Galactic Dynamics", Binney and Tremaine, Princeton University Press, 1987

"Galaxy Formation and Evolution", Ho, van den Bosch and White, Cambridge University Press, 2010