

Course guide 220314 - 220314 - Applications for Planetary Exploration

 Last modified: 22/04/2021

 Unit in charge:
 Terrassa School of Industrial, Aerospace and Audiovisual Engineering

 Teaching unit:
 748 - FIS - Department of Physics.

 Degree:
 Academic year: 2021

 Languages: English
 ECTS Credits: 3.0

LECTURER

Coordinating lecturer: Miquel Sureda Anfres

Others:

PRIOR SKILLS

During the lessons, students will need a good background on basic physics (fluid mechanics, optics, black body radiation, spectroscopy, astronomy) and space technologies (astrodynamics, spacecraft design).

TEACHING METHODOLOGY

The course is divided into parts:

- Theory classes

- Self-study for doing the final assignment

During the theory classes, the teacher will introduce the theoretical concepts, methods and results.

During the self-study hours students will need to work on the materials provided by the teacher in order to fix and assimilate the concepts.

The final assignment will require from the students to work on group and to manage their time in order to develop a complex project.

LEARNING OBJECTIVES OF THE SUBJECT

This course covers the basic principles of planetary detection as well as the science of planets atmospheres and interiors applied to the study of both our Solar System and extrasolar planets (exoplanets).

Applications for Planetary Exploration is focused on the automation, robotics and analysis techniques to study the structure and atmospheres of planets and the main characteristics of asteroids.

CONTENTS

Module 1: Our Solar System

Description:

This module tackles fundamental questions about our Solar System: formation, evolution and exploration of both the internal rocky planets and the outer giant planets.

Related activities: Theory lessons.

Full-or-part-time: 25h Theory classes: 10h Self study : 15h



Module 2: Exoplanets

Description:

In this module that main methods to detect exoplanets are explained. General concepts on doppler spectroscopy and transit photometry will be deeply analyzed.

Related activities: Theory lessons

Full-or-part-time: 19h Theory classes: 7h Self study : 12h

Module 3: Astrobiology

Description:

This module covers aspects of the origin and evolution of life on Earth, and the search for microbial and intelligent life elsewhere in the Universe.

Related activities:

Theory lessons.

Final assignment: the students will have to work on group to develop a planetary exploration project.

Full-or-part-time: 31h Theory classes: 10h Self study : 21h

GRADING SYSTEM

The course will be graded based on:

- Individual exercises: 40%

- Final assignment: 60%

In case of being unable to hand the exercises or not passing them, the student will have a second opportunity for the day of the final exam.

RESOURCES

Other resources:

Due to the characteristics of this course relevant web-based material and scientific publication will be the main source of information.