

## 220314 - Applications for Planetary Exploration

Coordinating unit:	205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering		
Teaching unit:	220 - ETSEIAT - Terrassa School of Industrial and Aeronautical Engineering		
Academic year:	2018		
Degree:	MASTER'S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING (Syllabus 2016). (Teaching unit Optional) MASTER'S DEGREE IN AERONAUTICAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)		
ECTS credits:	3	Teaching languages:	English

### Teaching staff

Coordinator: Miquel Sureda Anfres

### 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.

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### Content

<p>Module 1: Our Solar System</p>	<p>Learning time: 25h Theory classes: 10h Self study : 15h</p>
<p>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.</p> <p>Related activities: Theory lessons.</p>	
<p>Module 2: Exoplanets</p>	<p>Learning time: 19h Theory classes: 7h Self study : 12h</p>
<p>Description: In this module that main methods to detect exoplanets are explained. General concepts on doppler spectroscopy and transit photometry will be deeply analyzed.</p> <p>Related activities: Theory lessons</p>	
<p>Module 3: Astrobiology</p>	<p>Learning time: 31h Theory classes: 10h Self study : 21h</p>
<p>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.</p> <p>Related activities: Theory lessons.</p> <p>Final assignment: the students will have to work on group to develop a planetary exploration project.</p>	



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### Qualification 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.

### Bibliography

Others resources:

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