

# IS413 – Space environment and effects

From the Advanced Master TAS ASTRO (Space Systems Engineering)



## Highlights

- Physics and components interaction
- Use of professional simulation tools
- Experts from space research center

This module provides knowledge of the physics of the space environment encountered by the spacecraft. Participants will learn about the constraints imposed by the environment. It will be dealt with training techniques for predicting effects on materials, electronics components and embedded systems and the various solutions to mitigate these degradations and their impact on the functioning of the system involved.

## Prerequisites

- Master level

\*not compulsory

## Key elements

Dates: **8 - 21 October 2020**  
(exam: 27 Oct 2020\*)

Duration: **12 hours**

For whom:  
**recent graduates, jobseekers  
and experienced employees**

Location:  
**ISAE-SUPAERO, Toulouse**

Course fees: **1 600 €**

Language: **English**

## Learning objectives

After completing this course, participants will be able to:

- Identify constraints specifically imposed by space environment (micro-gravity, radiations...);
- Model with simulation tools the space environment.

## Practical information and registration

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## Course content

- Introduction to the space environment
- Description of the physics of space environment
- Radiations - materials interactions
- Charging of materials and systems in space environment
- Effects of the space environment on electronics components

## Teaching methods

| Teaching methods                           | Yes |
|--|-----|
| Lectures / tutorial                        | X   |
| Collaborative learning                     |     |
| Flipped classroom                          |     |
| Blended learning (online and face to face) |     |
| Learning by doing                          | X   |
| Project-based                              |     |
| Simulation                                 | X   |
| Case study                                 |     |

## Assessment

- Written test
- MCQ
- Marked Seminars