IS450a - Space systems architecture
From the Advanced Master TAS ASTRO (Space Systems Engineering)

Key elements

Dates: 10 Jan. - 23 Mar. 2022
Duration: 32 hours
For whom: recent graduates, jobseekers and experienced employees
Location: ISAE-SUPAERO, Toulouse
Course fees: 2 300 €
Language: English

Highlights

- Spacecraft architecture
- Interdisciplinary design
- Simulation tools

This module provides an interdisciplinary approach for preliminary design of an Earth Observation micro-satellite. Participants will use simulation tools to design all subsystems and perform budgets (mass, power, performances…).

Prerequisites

- Master level
- Orbital mechanics fundamental concepts

Learning objectives

After completing this course, participants will be able to:

- Create an optimal spacecraft architecture, applying an interdisciplinary approach;
- Model the satellite with a simulation tool.

Practical information and registration

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**Course content**

**Mission analysis**
- Orbitography
- Access
- Coverage
- Tracking error analysis

**Radio communications**
- Satellite emitter power
- Station emitter power
- Link budget calculation

**Thermal analysis**
- External flux analysis
- Temperatures calculation

**Power subsystem**
- Solar panel sizing
- Battery sizing
- Global analysis

**Attitude control system**
- External torques analysis
- Performance requirements
- Architecture definition
- Actuators and sensors sizing

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**Teaching methods**

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<thead>
<tr>
<th>Teaching methods</th>
<th>Yes</th>
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<tbody>
<tr>
<td>Lectures / tutorial</td>
<td>X</td>
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<tr>
<td>Collaborative learning</td>
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<td>Flipped classroom</td>
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<td>Blended learning (online and face to face)</td>
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<td>Learning by doing</td>
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<td>Project-based</td>
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<td>Simulation</td>
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<td>Case study</td>
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**Assessment**

- Written test
- MCQ
- Marked Practicals