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.

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

Teaching methods

<table>
<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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<tr>
<td>Simulation</td>
<td>X</td>
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<td>Case study</td>
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Assessment
- Written test
- MCQ
- Marked Practicals