HAD503 - Drone guidance & navigation
From the MS HADA
(Helicopter, Aircraft and Drone Architecture)

Key elements
Dates: 15 - 18 February 2021
Duration: 22 hours
For whom: recent graduates, jobseekers and experienced employees
Location: ISAE-SUPAERO, Toulouse
Course fees: 2 000 €
Language: English

Highlights
• Architecture of quadrotors
• Quadrotor modelling
• Design and tuning of drone control

This module provides thorough knowledge on architecture of embedded systems as applied to drones: autopilots, sensors, Inertial Measurement Units (IMU), modems.

Learning objectives
After completing this course, participants will be able to:
• Have an overview of the control and guidance architecture of drones,
• Master basic concepts of guidance and navigation for drones.

Prerequisites
• Basic knowledge in Aeronautics

Practical information and registration
Natalia Perthuis - 05 61 33 80 47 – info.exed@isae-supraero.fr
Course content

- Architecture of quadrotors: actuators, sensors, embedded systems, control systems
- Quadrotor modelling
- Quadrotor control architecture
- Fundamentals of control theory
- Design and tuning of inner loops control
- Overview of UAS in the world

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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<td>Simulation</td>
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<td>Case study</td>
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Assessment

- Lab report
- Oral exam