

AGENCY

SMART students complete ESA Academy's latest Concurrent Engineering Workshop

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A group of 30 adventurous university students from 11 different [ESA Member States](#) recently journeyed to the [ESA Education Training Centre, ESEC-Galaxia, Belgium](#). Their mission: spend 12 to 15 March 2019 in the ESA Academy's Training and Learning Facility engrossed in ESA Academy's latest Concurrent Engineering Workshop.

[Concurrent Engineering](#) is an innovative method of designing and developing products. Contrary to traditional design methods, in Concurrent Engineering all space mission subsystems are designed simultaneously, which, when used skilfully, can lead to huge improvements in efficiency. The ESA Academy's Training and Learning Facility is also an educational Concurrent Design Facility (CDF), which the students were able to use.

"The Concurrent Engineering Workshop is a one-of-a-kind opportunity for students from different European countries to meet and work together on the design of a scientific space mission concept," summarised a Polish student from the AGH University of Science and Technology. "The whole process goes under the eye of ESA experts who provide advice and clues. It was great to see how good cooperation between many engineers from different areas leads to the finalisation of a mission concept. There are two things I liked most: open-minded, smart and friendly people gathered in one place; and the teamwork spirit that accompanied us during these four days."

The students' goal was to become familiarised with the Concurrent Engineering approach and its benefits, and with the [Open Concurrent Design Tool \(OCDT\)](#) used in ESA's CDF. On hand to guide the students in their endeavours were two ESA CDF System Engineers, ably assisted by a Swiss National Trainee, from ESA's Systems and Concurrent Engineering Section. To kick things off, the students gathered to play the [EcoDesign](#) game and learn about the environmental impacts of a space mission. It was a good opportunity for them to get to know each other as well as learning about the lifecycle assessment of satellites.

The ESA Academy's training sessions strive for realism, so lessons were given within an exciting context – designing a hypothetical space mission. On the first day, the students were given their briefing: they must use Concurrent Engineering to design a probe called the SMART Mapper to chart the Moon's polar regions. They were also introduced to the Concurrent Engineering approach, along with how to use the OCDT software.

Could they design the mission in just four days? Normally this would be impossible, but Concurrent Engineering is a powerful method! *"The Concurrent Engineering approach is completely different from how I have ever worked,"* explained a German student from the Friedrich-Alexander University of Erlangen-Nuremberg. *"It's absolutely mind-blowing how 30 students can set up a full satellite within days. I think it's a great way to combine knowledge of many different research fields and let us learn from each other."*

The students were divided into teams to cover different disciplines: Thermal team presenting their results

1. Configuration
2. Structure
3. Mechanisms
4. Propulsion
5. Mission Analysis
6. Attitude and Orbit Control
7. Power
8. Thermal
9. Communication & Data Handling