

AGENCY

Students complete spacecraft communications training course

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As we launch ever-more advanced spacecraft to probe our Solar System and investigate space beyond, the question of efficient and reliable communications is of paramount importance. To better prepare the next generation of engineers, from 14 to 17 February, 22 university students from 14 nations took part in the Ladybird Guide to Spacecraft Communications Training Course 2017.

This was held at the [ESA Academy's Training and Learning Centre](#) , located within the ESA Redu Centre. Situated in Belgium's Ardennes region, ESA's Redu Centre was the perfect location, as it is responsible for controlling and testing a range of satellites as part of ESA's ground station network.

The attendees were tutored by an expert from the [European Space Operations Centre \(ESOC\)](#) who works for the [Advanced Mission Concepts Section](#) . Students learned about modulation, coding, protocols, radiofrequency transmission, and link budgets, all in an accessible manner from the basic concepts to more advanced understanding.

During an immersive simulation scenario the students had a taste of life as ESA engineers. They were split into teams and challenged to define the communication requirements and high level operational information for an interplanetary mission. Students had first to use their new understanding to answer questions from the other teams, with the trainer acting as a facilitator. During the latter stages of the course, the trainer quizzed them about their proposed solutions and gave them a real life scenario to solve with the students experiencing first-hand the operational impact of their previous decisions.

In addition, attendees were able to speak directly with two local ESA experts, hearing their personal stories about the success -- and failures -- of real missions. An Engineering student from France explained, "This training course didn't only teach us about the general functioning of spacecraft communications. We were also given anecdotes of critical situations faced by ESA experts in the field. This helped us fully understand the operational challenges in spacecraft communications on top of the theory and in that sense, the course was very enriching."

— Students attending a lecture

As an added bonus the students toured the site, seeing three of the Redu Centre's antennas, some baseband equipment, and the control room for ESA's PROBA satellites. They even had the chance to assist to a satellite pass and see the link to the spacecraft in real-time -- a memorable experience for the attendees!

A Romanian Electronics and Telecommunications student summed up the course by saying, "It was incredibly exciting to see how familiar concepts about communication systems are applied in spacecraft operations, especially when coupled with onsite visits that also allowed to better understand the whole chain of communications. The interactive courses, the challenging scenario we were given to work on, and the amazing people I met made this week an unforgettable experience, of great value for my future career."

ESA's Training and Learning Centre is offering several other training courses in different fields of ESA expertise, such as Standardisation, Product Assurance and Safety, Space Law, and Gravity-related Research later in 2017. Calls for applications will be published in the upcoming weeks... stay tuned!

For more information about ESA's Education opportunities for university students regularly visit the [ESA Academy page](#) , or sign up to [receive email updates](#) about our programme calls.