

AGENCY

ESEO & FYS – Ladybird Guide to Spacecraft Communications Training Course readies students to command their own satellites!

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ESA staff and visiting students are celebrating the successful completion of the recent ESEO & FYS – Ladybird Guide to Spacecraft Communications Training Course. Held from 3 – 6 July 2018 at ESA Academy's new Training and Learning Facility, in [ESEC-Galaxia](#), Belgium, there were 30 students from 11 different ESA Member and Associate States in attendance. Leading proceedings was a senior ESA Engineer from the [Advanced Mission Concepts](#) section of the [Operations Department](#).

This course was a special edition of the Ladybird Guide to Spacecraft Communications training event designed to support the [European Students Earth Orbiter \(ESEO\)](#) programme from the [ESA Education Office](#). This will see the actual launch and in-orbit operations of a real satellite. Students participating in these training courses will, in fact, be the spacecraft operators!

"The memory of this unforgettable week of the training course will always be really close to my heart," said a Hungarian student from Budapest University of Technology and Economics. "We could evolve a lot professionally because we were taught by a distinguished ESA expert with whose help we could take a glimpse into the details of spacecraft operation with special regard on the communicational parts, which useful knowledge gives us more insight in the communication process of our own satellites. Furthermore, I was given with the opportunity to meet those enthusiastic students who also have been working on a space project, and the friendships that were made there will be so valuable for me in my future."

— Mission complete! Happy attendees with their participation certificate.

Also in attendance were students from the Fly Your Satellite! (FYS) CubeSat programme of the ESA Education Office. They were gaining knowledge to help them prepare their miniature satellites, and develop their ground station and operations concepts. Attendees of this course are now able to relay the information to their ESEO or FYS team mates as they continue their projects, thus widening the influence of the training.

The overall objective of this latest course was to acquaint participants with the fundamental concepts behind spacecraft telecommunications. A "Ladybird approach" was taken, meaning that ideas were explained using concrete real-life examples and accessible diagrams, rather than emphasising analytical and mathematical skills. In this way, it is hoped that the gap between spacecraft operators and telecommunications designers can be addressed; usually designers find it very challenging to "think as operators", but in this course the operators' points of view are central to designing a ground station of spacecraft telecommunications subsystems. In the words of a Spanish student from KTH Royal Institute of Technology: "Without going into mathematical details, the course is an excellent and stimulating introduction to spacecraft communications. All the real-life stories about satellite operations were captivating and made it a lot easier to understand such complex systems."

Several telecommunications-specific topics were covered:

- Signal modulation and demodulation