

AGENCY

Product Assurance Awareness Training Course 2019 gives students valuable experiences

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29 university students from 12 different [ESA Member States](#) have completed the Product Assurance Awareness Training Course 2019. Running from 4 – 7 June 2019 and hosted at [ESA Academy's Training and Learning Facility](#), ESA-ESEC, Belgium, the course was a collaboration between the [ESA Education Office](#) and [Product Assurance and Safety Department](#), supported by TEC-ED and TEC-MS.

The goal was to equip the participating students with knowledge in Product Assurance (PA) and teach them how this is implemented in space projects for ESA and space businesses. PA engineers are responsible for failure-proofing missions, ensuring that the materials, mechanical parts, processes and electrical components used are fit for purpose over the entire lifetime of a mission. PA is critical for a successful space mission.

The training course was delivered by ESA experts in the form of modules, each covering a different discipline of PA. Many interactive activities were included to give students a taste of life as a real PA engineer, alongside more traditional lectures. During the week, the students were also given the chance to visit [ESEC-Redu](#) to learn more about its activities, including the [PROBA Control Room](#).

"This course has allowed me to explore a critical domain within Space Projects which is not taught in the classroom, but from years of experience obtained by experts," explained a British student from the University of Manchester. "As an engineer it's evident that I'm intrigued by HOW and WHY things work the way they do, similarly this course allowed me to appreciate how the success of an engineering project depends on the extent of its Product and Quality Assurance. It has been an exceptional opportunity beyond measure, and I am grateful to ESA for providing such a service; increasing my ability to observe, adapt and uncover new knowledge."

The week began with an introduction to space projects using the [MetOp satellites](#) as examples. Students were given insight into each step, from early design to operations, all the way through to a satellite's end-of-life. Space debris was also touched upon, as this is increasingly relevant to PA.

The bulk of the course was then given to discussing various fields within PA in order to give students a solid and comprehensive grounding. They started with Quality, Safety and Dependability, as those are essential aspects present in every phase of a space project, as well as multiple other PA disciplines. Numerous real-life examples were offered by the trainers, such as failed rocket launches and satellite crashes, allowing the students to clearly understand the value of the lessons.

— Interesting materials brought by the trainers

They then moved on to Software Product Assurance, and before long the students were appreciating how complex this aspect can be. They learnt that it is unwise to rely on redundancy in-built within software, but hardware can be used to ensure a satellite functions correctly, and even protect it from issues with its software! There was then time to discover interesting facts about materials and processes within the context of ensuring reliability when flying into space. A group exercise followed in which the students took on the role of PA inspectors to detect mistakes in a document they were tasked with reviewing!

The pace did not slacken on the final day. A lesson was given on Electrical, Electronic and Electro-mechanical (EEE) components, which are the fundamental building blocks of any spacecraft. What common malfunctions have the course trainers encountered, and how can PA